IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication JULY 28, 1960

★ Banker David Rockefeller Discusses—

Long-Term Impact of The "Common Market" p. 49

Next Labor Battle: GE vs. IUE p. 39

New Lance Doubles Steel Output p. 75

Digest of the Week p. 2-3

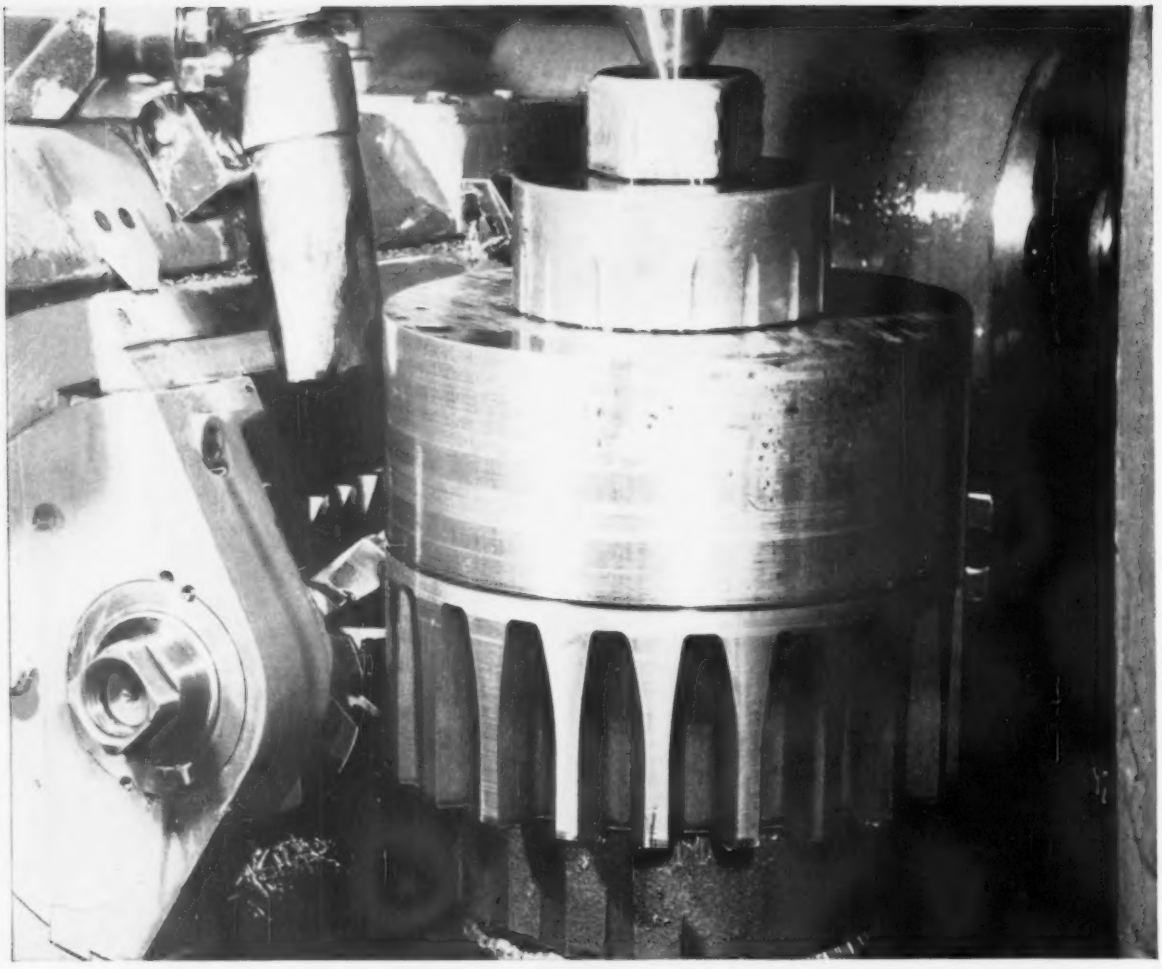

Photo courtesy Boston Gear

Aristoloy Leaded increases hob speed 50% . . . prolongs tool life 50% for Boston Gear

Together these add up to 100% satisfaction with Aristoloy Leaded* steel. By switching to Aristoloy Leaded, Boston Gear now machines three 7" Spur Gears per hour. Best production achieved on the steel previously used was two per hour.

With Aristoloy Leaded, 24 gears are cut before the hob needs sharpening . . . only 16 were possible with other steel used by Boston Gear.

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For complete information about Aristoloy leaded or standard analyses carbon, alloy, and stainless grades, write for booklet entitled, "A Complete Line of Leaded Steels," and new Products and Facilities Catalog.

*Inland Ledloy License

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A fable for rabbits
(and others)

Once, deep in the forest, there lived an industrious Beaver. He not only felled trees and built dams, but, on the land he cleared, he grew produce for a hungry family of rabbits. How they loved his fat, juicy carrots!

But one day Father Rabbit found that by crossing over the river on a fallen tree he could buy carrots more cheaply from a Raccoon who lived on the other side. Soon he was racing back and forth across the river. The Beaver shrugged his shoulders and went into the dry goods business. Then came a terrible flood. The fallen tree was swept away, and the rabbits could only huddle on the bank and gaze longingly across the river. They went back to the Beaver, who said, "Sorry, folks, but I'm out of the carrot business. Could you use a dozen hand towels?" One cold day Mr. Beaver met Father Rabbit foraging for food. The Rabbit was near starvation. He looked at the Beaver with tears in his eyes and wailed, "Where were you when I needed you?" And the Beaver replied, "Where were you when I needed you?"

Whether your needs be carrots or steel, your safest, most reliable suppliers are right here at home. No one knows the needs of American steel buyers better than American steel makers. To serve you, and serve you well, is our primary concern—not just today and tomorrow—but year after year.

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The IRON AGE

July 28, 1960—Vol. 186, No. 4

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★Starred items are digested at right.

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News of the Industry

LABOR FRONT

How GE Fights IUE—The issues between electrical manufacturers and the unions are deeper than cents per hour. A basic conflict, stressed by General Electric, exists in the bargaining. Last week's show of tempers is only the beginning of what promises to be a classic in labor negotiations. P. 39

COPPER

Eye to the Future—Leaders in the copper industry are investing in research. They have hopes that it will open up new markets. Dr. Charles H. Moore has been appointed technical director of the Copper Products Development Assn. P. 41

HOUSEHOLD APPLIANCES

Grim Third Quarter—Appliance makers are chopping prices, cutting output in order to slash large field stocks. But a reversal should come

in September. Inventories should be under control. And new models

Metalworking

Cover Feature

COMMON MARKET VIEW— Banker David Rockefeller greets business associates upon arrival in Brussels. This week he points out the problems and possibilities in the European Common Market. P.39

should bring production boosts as manufacturers fill distribution pipelines. P. 42

MACHINE TOOLS

Orders Up—June orders for machine tools are up, but all of the increase is from export. Little new tooling by auto companies hurts the domestic market. Most export is for special purpose tooling. P. 61

Engineering-Production Developments

OPENHEARTH STEEL

Greater Output — An oxy-fuel lance is being used successfully to double standard openhearth production rates. The lance drives large blocks of heat into the furnace at a rapid rate. By mixing and burning natural gas with oxygen, the meltdown time is reduced. Heats up to 5000°F are possible. P. 75

DIRECT CHILL CASTING

Improves Aluminum — A major producer of aluminum is getting very good results with its ingots using the direct chill casting technique. Further refinements in the grain structure are also realized by introducing degassing and nucleating pellets into the melt. The end result is quality. P. 78

APPRAISE YOUR SALES

With Ratio Systems—Stiff competition calls for a scientific sales program. Simple tables and charts predict vital factors. These include future sales trends, quotation activity and buyer-seller incompatibility. The ammunition can be found in company records. P. 80

IN-PROCESS GAGING

Of Aluminum Foil — Here's a plant that uses dual purpose X-ray gages as non-contact micrometers and automatic controllers on high-speed aluminum foil rolling mills. The results are material savings and more uniform products. P. 84

COLUMBIUM RESEARCH

A Step Forward — Several new columbium-base alloys have been developed to meet the brutal demands of missile and atomic applications. The new columbium alloys combine strength and oxidation resistance right up to 2550°F. P. 86

Market and Price Trends

AUTOMOTIVE

What's Behind It?—Ford's Scientific Lab turns the tables and departs from traditional research and delves into basic studies. The reason is that they might find the key to future developments. P. 53

WASHINGTON

Higher Taxes Probable — With election promises offering more and more, it now appears inevitable that taxes will be rising. Each party pledges to tap a different source, if they are elected in November. P. 57

WEST COAST

Metalworking Opportunities — The expansion of the petroleum industry on the West Coast, especially in California, is opening up new markets for metalworking. P. 59

STEEL SUMMARY

Automotive Orders — Automakers and their suppliers have begun ordering steel for '61 models. Buying covers a wide product range. P. 109

PURCHASING

Lower Inventories—John Hagerty, purchaser, Columbia Gas System, tells how he lowered inventories and cut his company's operating costs. P. 110

NEXT WEEK

HELP FROM PURCHASING

Cooperation Needed — Are you getting the most out of your purchasing department? Next week some top purchasing executives tell how other departments can improve their performance through cooperation with the purchasing group.

Control and Inhibit Acid Cleaning or Pickling with ACTIVOL

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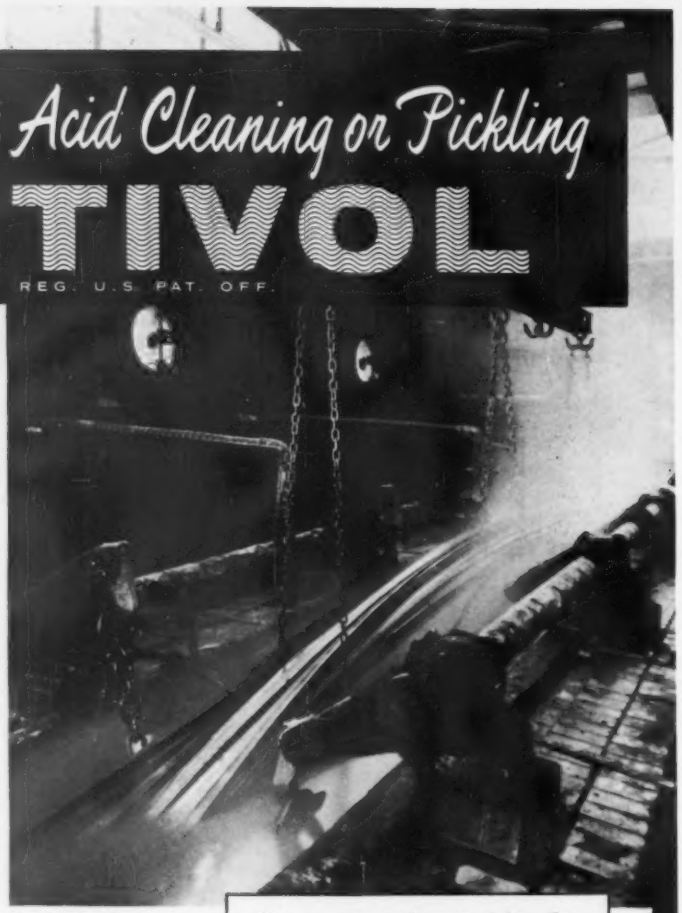

Photo courtesy of
PRECISION DRAWN STEEL CO.

Activol is a series of original chemicals that control and regulate the action of acid on metals for quicker or more effective removal of scale, rust, grease and salt deposits in acid baths. Cleaning and descaling can be accelerated or controlled while inhibiting the action of the acid on the base metal. Metals come out cleaner and brighter and at the same time the "bite" of acid fumes is reduced to a minimum.

There is an Activol powder or liquid for every purpose in pickling, acid cleaning, removing calcium or magnesium salts, preparing metal for painting and other acid cleaning operations.

Here are some important benefits ACTIVOL gives you:

1. **Controls or accelerates acid action while inhibiting the effect on base metal**
2. **Removes scale and rust, cleans off oil, grease and salt deposits without pitting or etching**
3. **Non-colloidal ACTIVOL reduces hydrogen embrittlement**
4. **Acid often lasts as much as 50% longer, requires less frequent replacement**
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6. **ACTIVOL is not a coal tar derivative—is completely soluble in all acid solutions**
7. **Compatible with any organic or inorganic acid**
8. **Costs less to use than other inhibitors**

Write, wire or phone for help on specific problems or further information on ACTIVOL additives.

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With the A-L Steelector System

How can you pick the right tool steel when there are more than 1000 brands, each jostling for your attention? And how can you pick a tool steel and know before you order that the grade you want is available—without delays—in the size and shape you need?

If you are tired of wrestling with these problems you will like the new Allegheny Ludlum Tool Steel STEELECTOR Program. With it you can accurately select a tool steel that will meet your requirements and be sure that you have picked a grade that is in stock . . . as near as your warehouse source.

It's easy to make accurate selections with the STEELECTOR Program. The three STEELECTOR cards—covering general purpose tool steel applications, hot work applications, and high speed grades—show at a glance the comparative properties of tool steel grades that will suit 96% of all tool steel applications listed in the A-L Tool Steel Handbook.

The STEELECTOR cards use bar graphs to make it easy to make precise comparisons of abrasion resistance, toughness, size stability, machinability, and red hardness. All you have to do is pick the grade with the particular combination of properties you need for the job at hand.

For each grade, there is a Data Stock List that tells you the exact analysis of the grade, its basic properties, typical applications and their working hardnesses, and temperatures for hardening, tempering, and annealing. And the complete range of available sizes and shapes is listed.

You can count on getting quality tool steel by using the STEELECTOR Program. Each STEELECTOR grade has been selected from the complete line of Allegheny Ludlum Tool Steel and made under the exacting quality control standards of all A-L products.

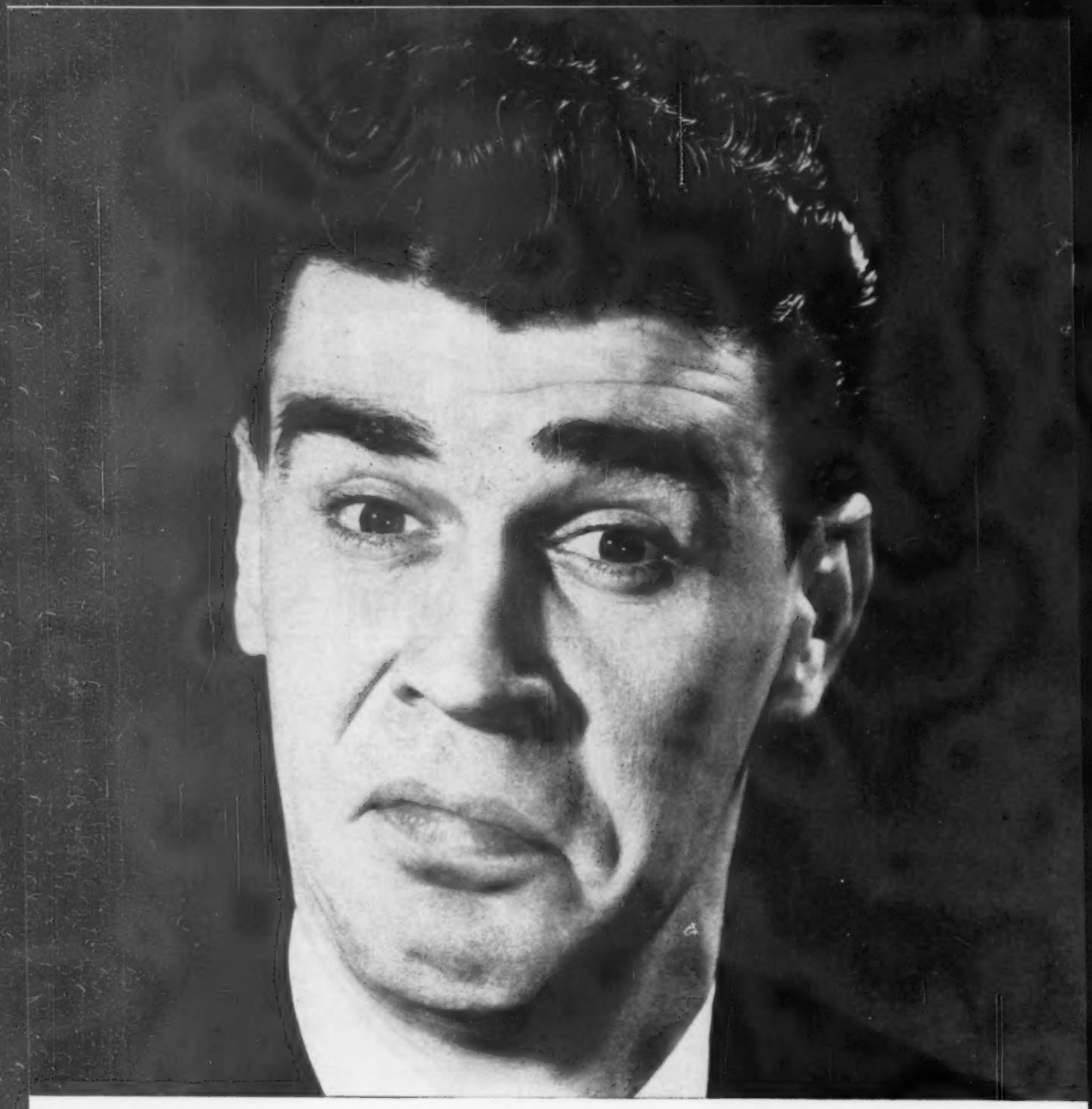
The new A-L Tool Steel STEELECTOR booklet contains the STEELECTOR Cards, descriptions of the various grades, and explains the individual Data Stock Lists available for every grade. For your own copy ask your Allegheny Ludlum sales representative, or write: *Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pennsylvania. Address Dept. IA-7-2.*

STEELECTOR PROGRAM

ALLEGHENY LUDLUM

Tool Steel warehouse stocks throughout the country

2084



"Two metalworking machines for the price of one?"

"I didn't believe it until a Ryerson machinery specialist showed me how.

"As a fabricator of stainless steel kitchen equipment, I was recently looking for a new squaring shear. I was considering one with a gap-type frame that would do my regular shearing, and an important notching operation as well. But when a Ryerson machinery specialist studied the problem, he recommended *two* pieces of equipment instead of one—at no increase in total cost. I got an underdriven shear and a universal metalworking machine that would do my notching plus many other jobs—adding versatility to my entire operation."

Why not have Ryerson study *your* machinery requirements? You'll get unbiased recommendations and a choice of 2800 different pieces of metalworking equipment. Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80, Illinois.

The "New" Frontiers: What's So New About Them?

A quick look at the Democratic platform is enough to freeze the blood of those who abhorred the New Deal. And it isn't very reassuring to those who were lukewarm to the various "deals" in the past.

Whether Mr. Kennedy will try to carry out the platform to the letter—if he were to be elected—is probably open to question. But his acceptance speech in Los Angeles certainly savors of radical liberalism.

His posture is one of intense personal leadership—a leadership that would issue strong orders from Washington for the whole nation; a leadership that would take from the people and from the states those rights and obligations to see our troubles through to the end.

Senator Kennedy is a new star in the sky, blazing a trail for "new frontiers"—which are probably nothing more than old frontiers revisited. In his case, the revisit might revive the professors, the experts, the has-beens, the idealists, the workers, the crackpots, and the people with "a mission."

They would—as they did in the past—descend on Washington with their nostrums and their centralized philosophies. They would bring their bids for intellectual control of those of us whom they feel need more forceful guidance — i.e. dictatorship by forceful stateism.

Now maybe this is being unfair to Senator Kennedy. But a close reading of what he has to say and what the Democratic platform says makes it pretty clear that Senator Kennedy, or his group, feels the nation is in the hands of oldsters and fuddy-duddies who are letting the people down.

Senator Kennedy and the young ones around him who did such a masterful job of landing the nomination saw little of—and probably know little about—the late Great Depression. They know less about the nostrums, the alphabet agencies and the vast-blue-yonder of idealism—with people as economic guinea pigs. All of that took place in the early thirties.

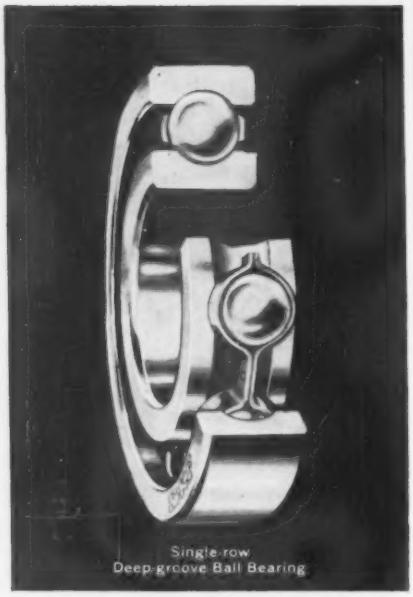
What is suggested now is so close to what we have had in the past that it is no wonder some of the "older" liberal conservatives are startled.

But we at least will have a good chance in this election to choose between a radical liberalism and a liberal conservatism.

Let's hope we know what we are doing!

Tom Campbell

Editor-in-Chief



Can a standard bearing offer you "more bearing" for your money?

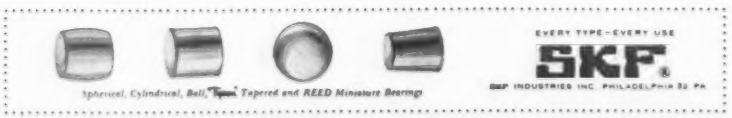
It can if it's made by SKF—because all SKF bearings, both ball and roller, offer special qualities at "production" bearing prices.

Take the single-row deep-groove ball bearing featured here, as an example. SKF designs and builds this type to sustain heavy radial load and thrust load in either direction. Furthermore, it is engineered to run smoothly and quietly at normal speeds with grease lubrication—and at high speeds with oil.

Yet this is a standard SKF ball bearing, mass-produced by automated production equipment at our plant at Altoona, Pa. You can quickly get this bearing in over 100 sizes, ranging from 5/8" to 15.748" O.D., and in a variety of seal, shield and snap-ring combinations.

But why not find out what SKF offers in bearing quality, availability and economy? Just call the SKF branch office nearest you.

6001


Spherical, Cylindrical, Ball, Tyson Tapered and REED Miniature Bearings
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Wire Accents High Strength

High-strength wire having 575,000-psi tensile strength is now a regular production item. The wire is a high-carbon steel wire (0.09 pct C) in 0.005 in. diam and finer. Larger sizes are expected with slightly reduced tensiles. It is brass finished in continuous lengths up to 2 lb and on spools to 10 lb.

Plates Zirconia Insulator

The number of materials that can be applied by the plasma arc process is growing. The Linde Co. now has a zirconia coating for use with this high-temperature plating process. It will be used mainly for insulating purposes. Materials that are now being applied include tungsten and other refractory metals.

Russians Plate Tool Tips

The Leningrad Machine Plant is iron plating its carbide tips before and after brazing them to cutting tools. Severe cutting tests made on high-strength stainless steel prove the process has added life to carbide cutters. The iron coating is said to stop tip cracking and the separation of tips from tools.

Sintered Nickel Adds Life

Powder metallurgy is slated to fulfill another unique application—cathodes for electron tubes. It's expected that the sintered nickel will improve cathode reliability, increase uniformity and lengthen the life span of a wide variety of receiving tube types. The technique differs from other methods where cathode materials are melted and cast from ingots.

Spent Uranium Finds Uses

Uranium whos radioactivity is used up, is building up at a rate of many millions of pounds per year. However, it shows promise as an alloying element for tool steels. After the fissionable isotope U235 is used, the excess can serve as a scavenger for impurities in steels and other metals. Other uses include: spheroidizing agent in making nodular iron, agent for strengthening metals by dispersion hardening, a gamma-ray shielding material and a constituent of bearing metals and high-density alloys.

New Process for Graphite

Researchers at the Illinois Institute of Technology have developed a new method of making molded graphite for the AEC. The process greatly reduces time and cost. Carbonization and graphitization steps are combined in a single heating and control cycle. Key to the process is the use of a synthetic binder, furfuryl alcohol. It's combined with petroleum coke and heated directly to the graphitization temperature without intermediate cooling.

Larger Machine Needed

The biggest, most powerful radial draw former yet envisioned may be in the works. The same techniques used for draw-forming missile rings may be used to form heavy circular ribs for atomic submarines. This would require a unit of several thousand tons rating compared to about 150-200 tons maximum so far.

Dial-in Controls Expected

Big surprise of the machine tool show this fall may be dial-in machine control rather than more exotic tape control jobs. Experts say a surprising number feature this type of low-cost control. The operator programs the job right at the machine, shortcutting the tape preparation task. Also, cost is said to be very attractive, not too much higher than that of the basic machine.

Sintered Nylon Self-lubes

Porous nylon with a self contained lube supply shows promise for many applications. The nylon parts are formed by cold pressing and sintering specially processed nylon powders by techniques similar to those used in powder metallurgy. The oil-filled parts operate for long periods at a frictional coefficient as low as 0.01. Their major use will be for bearings.

1,000 Feet of NORMALIZING LINE at Inland Steel

This is another major unit in the continuing expansion program of Inland Steel Company of Chicago. The line normalizes cold rolled mild steel strip, 16 to 24 ga., 24 to 60″ wide, at furnace speed of 50 to 125 f. p. m. 60,000 lb. coils are fed into the line and 40,000 lb. coils are handled at the delivery end. Shearing facilities included in the line are suitable for sheets from 36″ to 192″.

Aetna-Standard's experience with Processing Lines dates back to the earliest production of strip in coils. This experience includes the design and building of many Continuous Electrolytic Tinning, Annealing and Normalizing Lines, as well as Continuous Galvanizing Lines. Aetna-Standard Division, Blaw-Knox Company, 300 Sixth Avenue, Pittsburgh, Pennsylvania.

Aetna-Standard Division
BLAW-KNOX

LETTERS FROM READERS

New Approach

Sir—If it is at all possible, I would like a reprint of your "Special Report on Automation" (IRON AGE, June 30, 1960). This new concept on automation is an excellent approach to many problems that often arise in fully automating a production line. I feel, as a mechanization engineer, that by applying this new approach to automation, in various phases of our production lines, we will not only increase our volume but it will also result in a better product.—John H. Thorpe, Texas Instruments Inc., Dallas, Tex.

▪ **Reprint has been mailed.—Ed.**

Wants Booklet

Sir—On page 117 of the May 19 issue of IRON AGE, we read with interest the article on "Screw Machines Not Always Money Makers."

A booklet was mentioned in this article that was published by NSMPA and we would very much like to obtain a copy. Can this booklet be purchased from you? If not, will you kindly advise us where we can obtain a copy?—Raymond I. Bond, Veeder-Root Inc., Hartford, Conn.

▪ **Send requests to: National Screw Machine Products Assn., 2860 E. 130th St., Cleveland 20, O.—Ed.**

Deserves Applause

Sir—A job so well done as your editorial in the July 7, 1960 issue of IRON AGE deserves applause.

Consequently, it occurred to me that you might be interested in the so-called "general memo" that I've sent to each one of our salesmen out in the field—and approximately 400 of these "general memos" have gone into the mail.—F. F. Loock, Allen-Bradley Co., Milwaukee, Wis.

▪ **Thank you and particularly for the comment in the memo: "Mr. Campbell's editorial is like a breath of fresh air."—Ed.**

A Jewel

Sir—I just had to tell you, after referring to your famous page 7, issue of July 14, 1960, that your editorial "Our Next President: Lord Have Mercy on Him" is a jewel—J. T. Somers, Wyckoff Steel Co., Pittsburgh, Pa.

Thank You

Sir—For your editorial . . . "A Nation Comes of Age, and Becomes Better for It," I thank you from the bottom of my heart.—Edwin Lex Bacon, New York.

Great Interest

Sir—We have read with great interest the article "Ratio Systems Give Management the Tools for Big Decisions," in your July 14 issue. We would appreciate very much your sending us three copies of this article.—K. J. Znotins, Progressive Welder Canada Limited, Chatham, Ontario.

▪ **They're on the way.—Ed.**

The IRON AGE

"That fictitious salesman you were laughing at so heartily happens to be you."

PUZZLED ??

ABOUT TOOL STEELS AND CARBIDES?

- *Who Makes it?*
- *What's the Analysis?*
- *Is it Tough?*
- *Is it Wear Resistant?*
- *Are there similar Brands?*

DON'T MISS . . .
The IRON AGE
DIRECTORY
of TOOL STEELS
and CARBIDES
in the August 11, 1960

MACHINE TOOL EXPOSITION

Issue of The IRON AGE

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- *Forging, Heat Treating Data*
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ANOTHER LINDE steel mill oxygen plant

This 500-tons-a-day oxygen plant, shown here under construction, is now on stream.

...with no capital investment

Steel producers are buying more and more LINDE oxygen. Since 1955 LINDE has put on-stream close to an average of one plant a month, most of them feeding oxygen to steel's furnaces. The 500-tons-a-day plant shown above is one of these.

Steelmen like the system—

- Because LINDE invests the capital, pays the labor, buys the power, and guarantees oxygen supply for steelmaking.
- Because steelmen make the steel—and LINDE makes the oxygen.
- Because steel money buys steel facilities—and LINDE buys oxygen capacity.

Right now, LINDE is building more than $50,000,000 worth of new oxygen facilities. Production will soon begin at new or expanded facilities at 16 locations. Oxygen capacity will jump by more than 4,000 tons a day.

This means—more single customer plants . . . more liquid oxygen to back up those on-site plants.

Absolute dependability—

Every plant has to be shut down some time. But, there are more than 100 locations where LINDE is producing or has bulk quantities of liquid oxygen in storage. This is a degree of *back-up insurance* no one else can approach.

For your *guaranteed* supply at lowest possible overall cost, call LINDE COMPANY, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N. Y. Offices in other principal cities. *In Canada:* Linde Company, Division of Union Carbide Canada Limited, Toronto 7, Ontario.

LINDE COMPANY **UNION CARBIDE**

LINDE and UNION CARBIDE are registered trade marks of Union Carbide Corporation.

FATIGUE CRACKS

Important Bylines

You will notice a well-known man with a famous name on this week's cover. He is David Rockefeller, vice chairman of the Chase Manhattan Bank and one of the famous Rockefeller family.

Beginning on p. 49, Mr. Rockefeller writes the first part of a new series on the European Common Market. He knows his field. As vice chairman of Chase Manhattan, he concentrates on long-range planning, including the bank's wide activities abroad.

Long-Range Program—While we are proud of having Mr. Rockefeller on our cover, we'd like to point out that his story is part of a long-range program of bringing to IRON AGE readers opinions of top men in their field who have something important to say.

This project was initiated and carried out by our managing editor Eugene C. Beaudet. In the course of the project, he has sought out, contacted leading people in their fields, urged them to present their views.

On the Record — Among those who have been on our cover are Benjamin F. Fairless, former head of U. S. Steel Corp. and now president of the American Iron and Steel Institute; George M. Humphrey, former Secretary of the Treasury and present chairman of National Steel Corp.; industrial designer Raymond Loewy, to name just a few.

We'd like to point out that this is a back-breaking program that requires hours of research and planning. Not all the people who you might expect have something important to say are willing to go on the record.

And, unfortunately, many of those who are willing (and eager) to write stories for us, don't come up to our standards either as a recognized authority or in their willingness to give the time, thought and effort to make an important contribution to management.

Handling authors is a tough job at best. But this week we'd like to give a special nod to our important bylines.

And so to keep our readers highly informed we plan to bring you more articles by industry's leaders in the future.

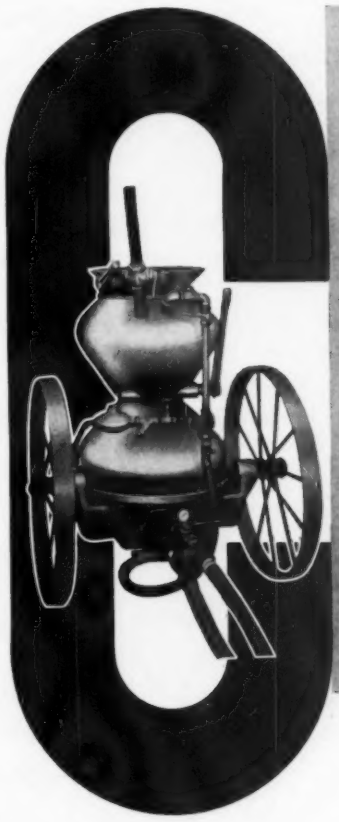
Back Issues

We're often asked who photostats or tear sheets of IRON AGE articles that appeared a year or more ago. Since we can't keep back issues for more than a year—and often run out of some before then —one alternative is photostats. But that takes time and is never too satisfactory.

Often, a back issue dealer can help. Here's one which keeps a pretty good stock: You may save time by writing him directly. Address: Back Issues Corp., 805 Mamaroneck Ave., Mamaroneck, N. Y.

Microfilms of back issues are available from University Microfilms, 313 N. First St., Ann Arbor, Mich.

"He looks like a real digger."



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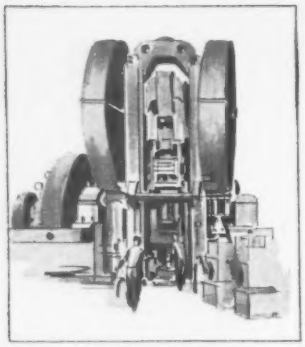

KILBYSTEEL *Announces*

- THE FIRST MECHANICAL TUBE EXTRUSION PRESS IN AMERICA
- THE LARGEST AND FASTEST IN THE WORLD
- THE WORLD'S ONLY SEAMLESS MILL EMPLOYING EXTRUSION AND THREE ROLL REDUCTION

NOW PRODUCING

CARBON AND ALLOY SEAMLESS STEEL TUBES
OF INHERENT, SUPERIOR QUALITY

1 SMOOTH INSIDE SURFACE
Round Billet is Pierced Around Precision-Ground Sliding Mandrel *Versus* Stationary Plug Piercing.

2 ACCURATE CONCENTRICITY
Mechanically Guided Piercer *Versus* Floating Plug Piercer.

3 UNIFORM WALL THICKNESS
Three Roll Size Reduction *Versus* Two Roll Reduction.
50% More Roll Pressure Points
50% Less Chance of Variation

4 IMPROVED PHYSICALS
Instantaneous Extrusion Impact *Versus* Prolonged Spiral Rolling.
Approximately Equal Transverse and Longitudinal Properties, resulting: Higher Tube Hoop Strength.

5 FAST PIERCING AND REDUCTION OF HARDEST STEELS
Extrusion Speed Rates up to 25 Feet per Second *Versus* Tedious Plug and Roll Piercing.

Elapsed Time from Billet to Hot Finished Tube, 33 Seconds *Versus* Reheating and Reduction.

SIZES UP TO 3½" O.D.

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ESTABLISHED 1889
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P. O. Box 1489 Cables: KILBYSTEEL Phone ADams 7-2841

K Blue Bonnet S
OIL WELL TUBING

K seamless S
QUALITY TUBES

COMING EXHIBITS

Machine Tool Exposition—Sept. 6-16, International Amphitheatre, Chicago (National Machine Tool Builders Assn., 2139 Wisconsin Ave., Washington 7, D. C.)

Production Engineering Show—Sept. 6-16, Navy Pier, Chicago, (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Coliseum Machinery Show — Sept. 7-15, Chicago. (Contact: A. B. Perkins, 2216 South Hill St., Los Angeles 7, Calif.)

Iron & Steel Show — Sept. 27-30, Cleveland Public Auditorium, Cleveland, O. (Association of Iron & Steel Engineers, 1010 Empire Bldg., Pittsburgh 22.)

Metal Show—Oct. 17-21, Convention Hall, Philadelphia. (American Society for Metals, Metals Park, Novelty, O.)

Die Casting Exposition & Congress—Nov. 8-11, Detroit Artillery Armory, Detroit. (The Society of Die Casting Engineers, 19382 James Couzens Highway, Detroit 35.)

MEETINGS

SEPTEMBER

American Machine Tool Distributors Assn.—Annual meeting, Sept. 3-4, LaSalle Hotel, Chicago. Association headquarters, 1500 Massachusetts Ave., N. W., Washington 5, D. C.

Assn. of Lift Truck & Portable Elevator Mfrs.—Fall meeting, Sept. 12, The Cavalier Club, Virginia Beach, Va. Association headquarters, One Gateway Center, Pittsburgh 22, Pa.

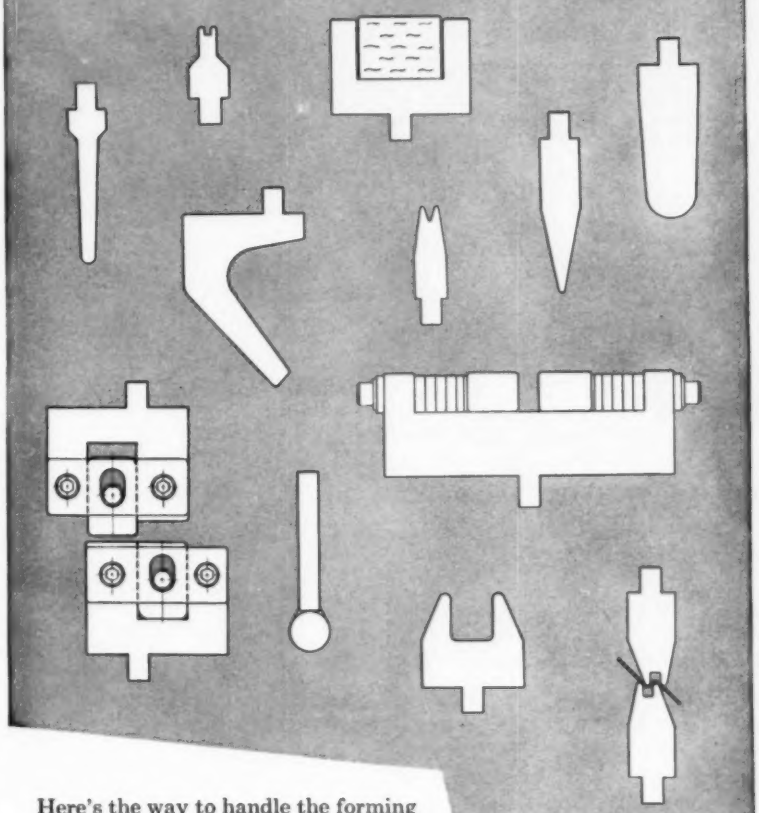
Electronic Industries Assn. — Fall conference, Sept. 13-16, French Lick-Sheraton, French Lick, Ind. Association headquarters, 1721 DeSales St., N. W., Washington, D. C.

American Die Casting Institute—Annual meeting, Sept. 14-16, Edgewater Beach Hotel, Chicago. Insti-

(Continued on P. 16)

Alloy Forming for
AIRCRAFT
MISSILES
ROCKETS
and
OTHER FABRICATIONS

CHICAGO®
ALLOY-FORM DIES
For All Makes of Press Brakes



Here's the way to handle the forming operations on the many alloys entering into the construction of aircraft, missiles, rockets, and other fabrications.

CHICAGO Alloy-Form dies are premium dies with superfine finish on the forming edges to prevent marring the polished material surfaces. And, the wear surfaces of the dies are induction hardened (approximately Brinell 500) for longer life without reworking. These dies will fit any make of press brake.

Illustrated are a few of the commonly used types available for prompt delivery. For further data ask for Bulletin AFD-958.

Complete recommendations and quotations on Alloy-Form dies or any special die upon request.

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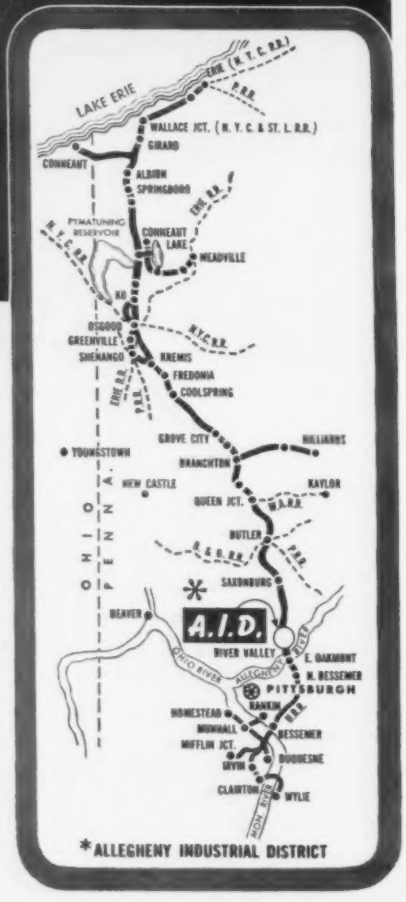
DREIS & KRUMP MANUFACTURING CO.
7430 S. Loomis Blvd., Chicago 36, Illinois

Press Brakes • Press Brake Dies • Straight-Side-Type Presses
Hand and Power Bending Brakes • Special Metal-Forming Machines



Now is the *right time* to build your new plant or warehouse, and the *right place* is the 140 acre fully developed Allegheny Industrial District. Just 14 miles from downtown Pittsburgh, you get fast Bessemer freight and piggyback service to the nation's principal markets via seven major trunk lines. There's quick access to major highways, too.

Other strategic advantages of an Allegheny Industrial District site are: 24-hour delivery of steel and other basic materials; an ample labor force with skills widely diversified; all utilities to meet any production or warehousing need; located at the center of America's No. 1 market area.

Investigate today! Write or phone for location factors. Complete confidence is assured.

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The Bessemer Man is at your "Site Service"

MEETINGS

(Continued from P. 15)

tute headquarters, 366 Madison Ave., New York.

National Foundry Assn. — Annual meeting, Sept. 22-23, Edgewater Beach Hotel, Chicago. Association headquarters, 53 W. Jackson Blvd., Chicago.

Porcelain Enamel Institute, Inc.— Annual meeting, Sept. 25-28, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 1145 19th St., N. W., Washington, D. C.

Farm Equipment Institute—Annual convention, Sept. 25-28, The Statler Hilton Hotel, Dallas, Tex. Institute headquarters, 608 S. Dearborn St., Chicago.

American Welding Society — Fall meeting, Sept. 26-30, Pittsburgh. Society headquarters, 33 West 39th St., New York.

OCTOBER

Metal Lath Mfrs. Assn.—Fall meeting, Oct. 6-7, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters, Engineers Bldg., Cleveland.

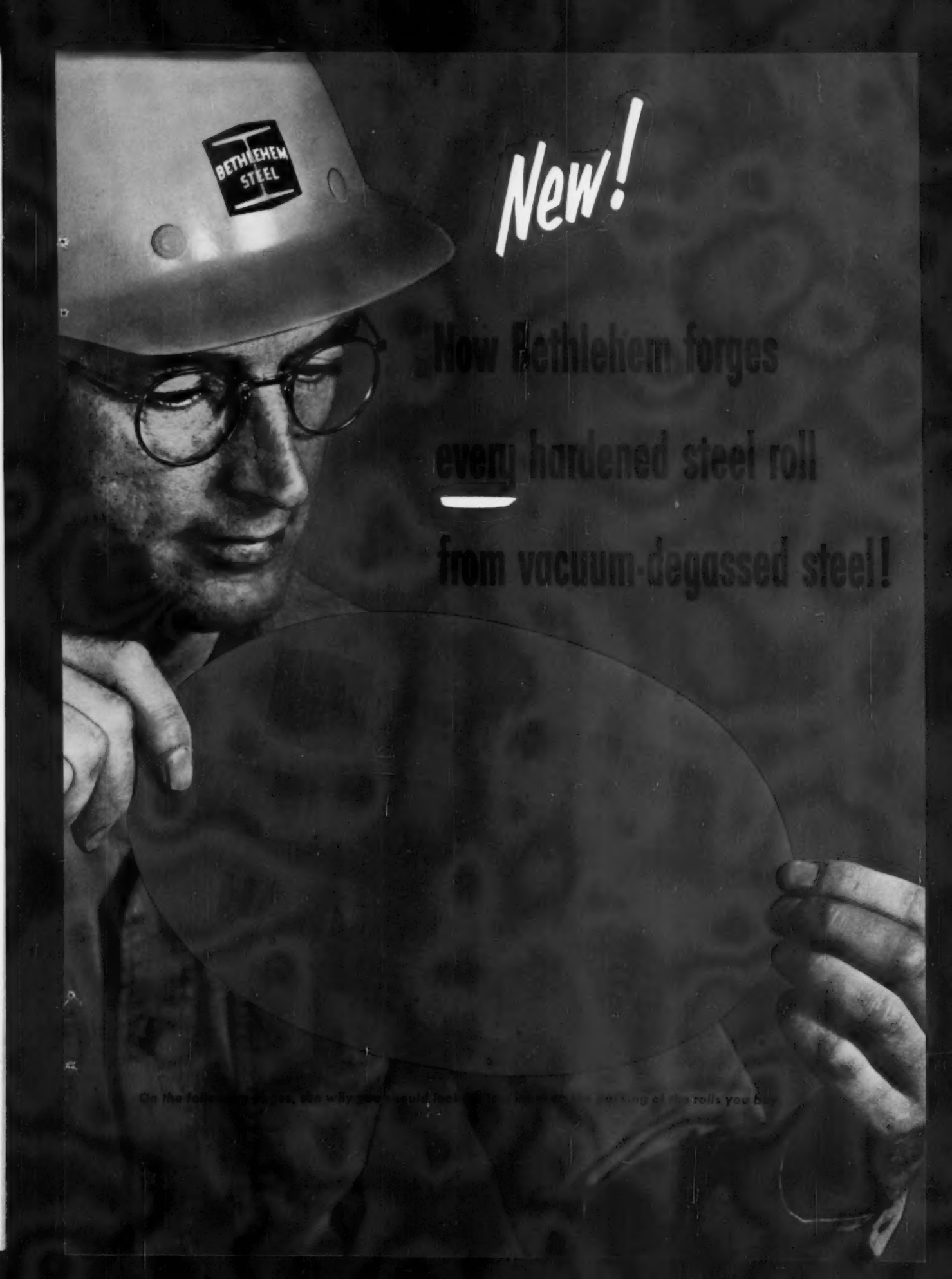
The Electrochemical Society, Inc. —Fall national meeting, Oct. 9-13, Shamrock Hotel, Houston, Tex. Society headquarters, 1860 Broadway, New York.

American Gas Assn.—Annual convention, Oct. 10-12, Atlantic City. Association headquarters, 420 Lexington Ave., New York.

Pressed Metal Institute — Annual meeting, Oct. 10-14, Shawnee Inn, Shawnee-On-Delaware, Pa. Institute headquarters, 3673 Lee Rd., Cleveland.

Marking Device Assn. — Annual convention, Oct. 12-14, Hotel Roosevelt, New York. Association headquarters, 912 Chicago Ave., Evanston, Ill.

Steel Boiler Institute, Inc. — Fall meeting, Oct. 12-14, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 1308 Land Title Bldg., Philadelphia.


BETHLEHEM STEEL
New!
Now Bethlehem forges every hardened steel roll from vacuum-degassed steel!

Bethlehem vacuum-degassed steel minimizes the hazard of roll breakage

Pint size, king size, every in-between size. Now Bethlehem forges *every* hardened steel roll from vacuum-degassed steel.

Pioneer in "vacuum casting"

Bethlehem pioneered the development and use of vacuum-degassed ingots for highly stressed applications in the electric power, atomic energy, and other industries.

Our advanced steel-pouring techniques now permit us to pour molten steel from a furnace ladle to a secondary ladle within a vacuum chamber, and thereby remove harmful gases (we can also pour directly into a mold in the vacuum chamber). The secondary ladle is then taken out of the chamber and ingots of suitable size for hardened steel rolls can be cast under a blanket of inert gas.

Less gas means sounder steel

Because the vacuum-casting method reduces the volume of hydrogen and other gases, the steel is sounder, tougher, and cleaner than air-cast steel. It is this greater internal soundness which reduces the hazard of roll breakage.

Over 350 rolls now in service

In the past several years, we've produced and shipped over 350 large, vacuum-degassed hardened steel rolls. The outstanding performance of these rolls confirms our own production experience, which clearly proves the superior soundness of vacuum-cast rolls as compared to air-cast rolls.

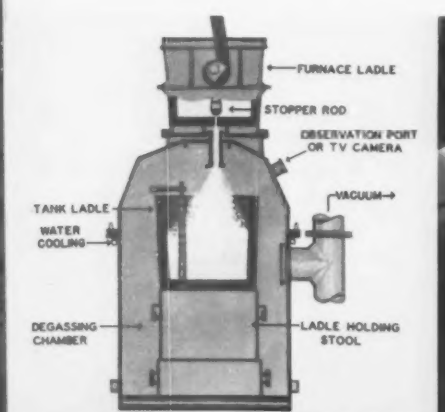
Fast delivery . . . no extra cost

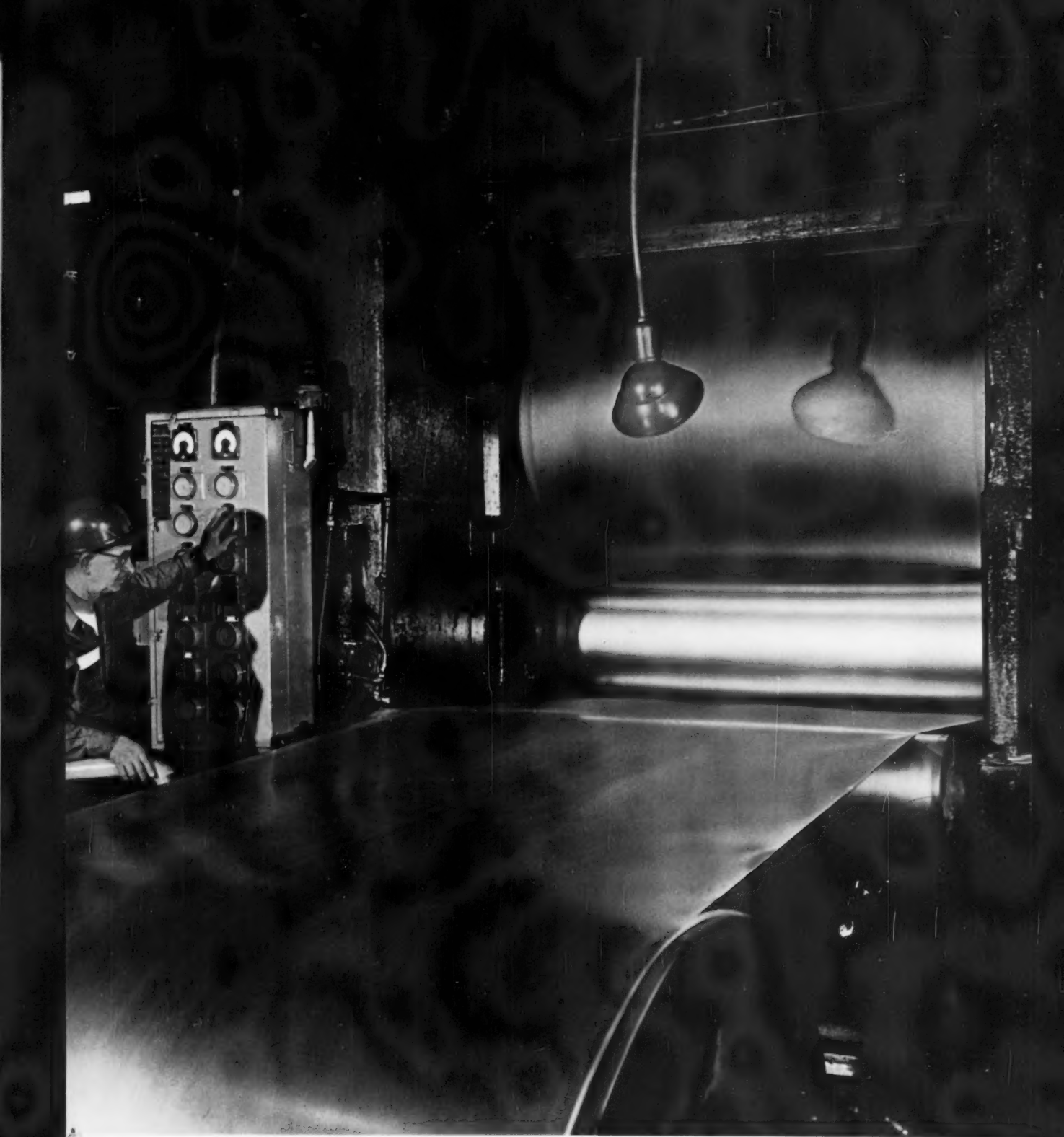
You have everything to gain (less roll breakage), nothing to lose (no price extra) by making your next purchase of hardened steel rolls Bethlehem vacuum-degassed rolls. Deliveries are excellent. Our sales offices are ready to give you the *whole* interesting story of this new Bethlehem development. Call or write the office nearest you today. Or write to us at Bethlehem, Pa.

STEEL IS TAPPED from the furnace into the furnace ladle. The furnace ladle is then attached to the vacuum tank, and the molten metal pours through a vacuum-tight seal into either a secondary ladle or a mold inside the degassing chamber. If poured into a ladle, ingots can be subsequently cast from this ladle under a blanket of inert gas.

TV TELLS HIM WHAT'S GOING ON. One TV camera peers inside the high-vacuum chamber into which the hot steel is gushing and shows the stream coming from the furnace ladle (top screen). Another camera, whose picture appears on the bottom screen, shows the action of the hot steel as it flows into either the secondary ladle or the mold set up inside the vacuum tank.

ULTRASONIC SOUND WAVES, pitched so high you can't hear them, penetrate every inch of the Bethlehem vacuum-degassed roll you see here. The waves relentlessly search out any possible inner discontinuities which, if present, would be indicated on the screen. When the Bethlehem inspector gives his OK, you can rely on the soundness of that roll.





BETHLEHEM VACUUM-DEGASSED ROLLS are made for every application—cold-rolling steel sheet, strip, tinplate, and non-ferrous metals. Every roll meets your specifications *exactly* on size, shape, hardness, and finish.

BETHLEHEM STEEL

BETHLEHEM STEEL

CHECKING EVERY DETAIL is more than a routine habit in the making of Bethlehem vacuum-degassed forged rolls. It's done with an extra measure of thoroughness, extra care—from the analysis of the steel to the critical inspection of the finished product.

These are the new symbols of quality for hardened-and-ground forged steel rolls

LOOK FOR THIS LABEL on the packing of the hardened steel rolls you buy. It's your guarantee that your rolls are forged from Bethlehem vacuum-degassed steel . . . steel that minimizes the hazard of roll breakage in your plant.

LOOK FOR THIS "V" STAMP on the ends of the rolls you buy. . . . "V" is for vacuum. You'll find this permanent identification on every Bethlehem roll from now on . . . because from now on Bethlehem forges hardened steel rolls only from vacuum-degassed steel.

For strength
. . . economy
. . . versatility

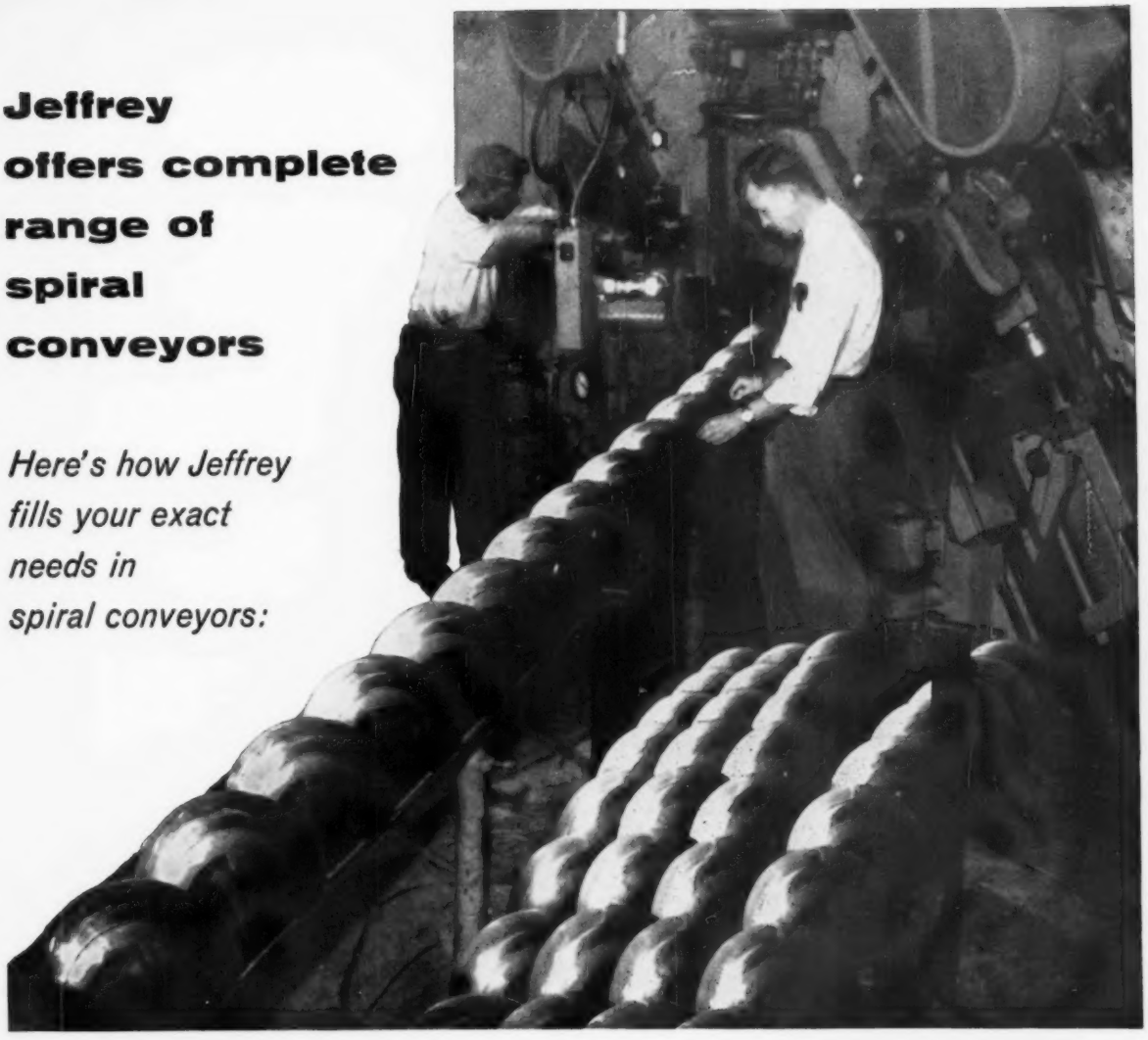
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

Jeffrey offers complete range of spiral conveyors

Here's how Jeffrey fills your exact needs in spiral conveyors:



- Complete range of types—sectional spirals, ribbon conveyors, cut flight conveyors, short pitch conveyors, double flight conveyors—all in a wide range of diameters and thicknesses.
- Stock is maintained on all widely used types, permitting Jeffrey to make fast shipment.

Standard conveyors are made in mild or abrasive resistant steels. Where heat-resistance or corrosion-resistance is required, you can select Jeffrey spirals in stainless steel, brass, Monel, aluminum, or other special metals.

With Jeffrey spiral conveyors you get a complete selection *plus* extras in quality—precision fit, smooth flight surfaces and non-toxic protective coating. For full information write for Catalog 951. The Jeffrey Manufacturing Company, 925 North Fourth Street, Columbus 16, Ohio.

Centrifuge cake ranging from 62 to 67 per cent solids are transferred to a mixer by a 16" diameter Jeffrey Spiral Conveyor at the lime reclaiming plant of the City of Lansing, Michigan.

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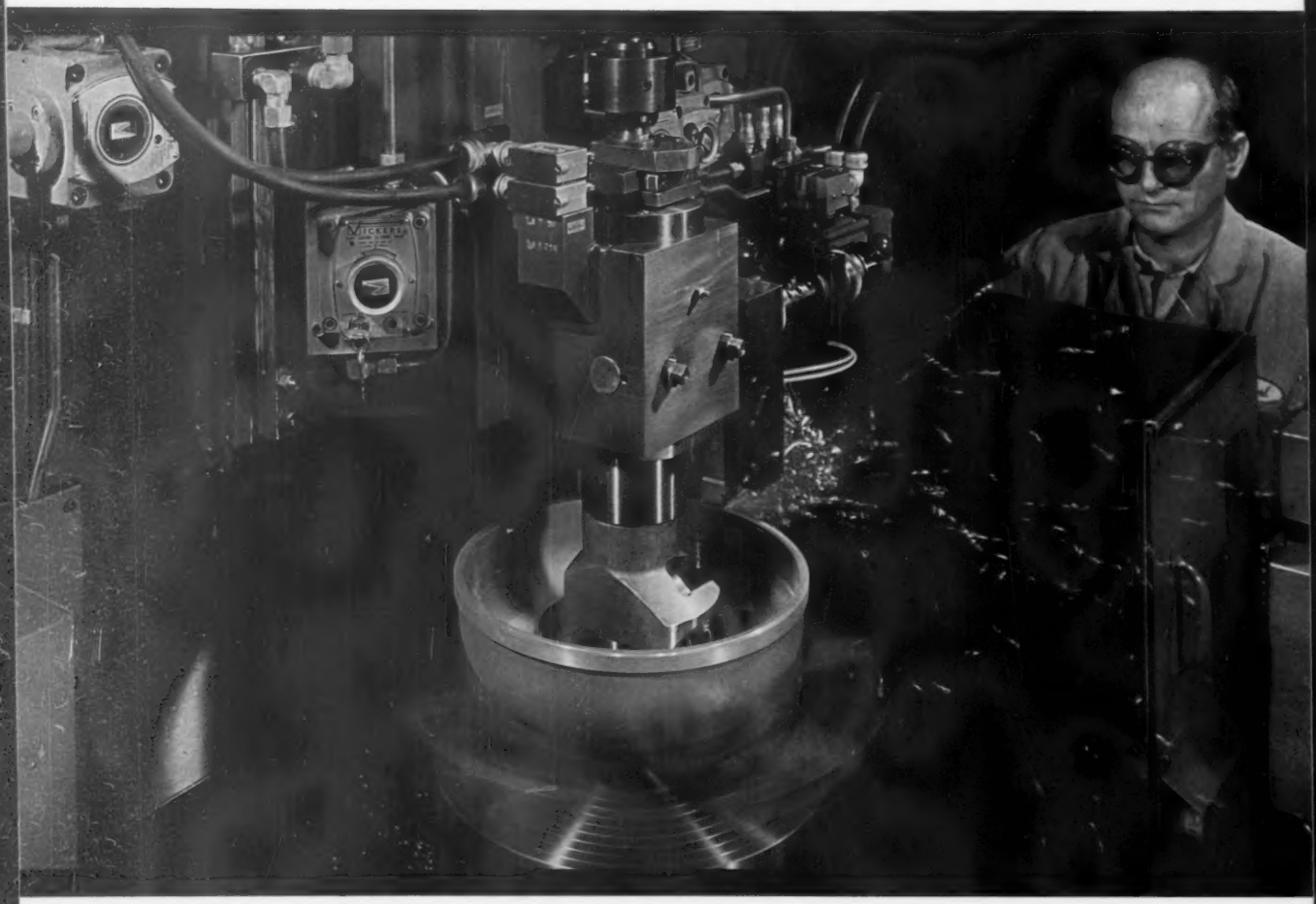
MOTCH and MERRYWEATHER



CUTTING POWER ON COMMAND! Each Vertical Turner is engineered to your specifications from *production-built* low-cost components. Initial machine costs are slashed! Costs of parts made with this tool are cut in half and more!

Never has there been a machine tool which has met with such immediate enthusiasm by production men. It provides utility and productivity in a versatile package to fit your specific turning, facing, tracing, and boring needs!

Check these sensational cost-cutting advantages and features and phone our distributor today for an appointment to see and learn more about this revolutionary new machine tool. We'll be happy to show you how to replace obsolete metal-cutting machines — *profitably!*

Time comparison on machining motor end bells at Electra Motors, Anaheim, California.

OLD WAY

Part A-8274 (Frame 284 and 286)

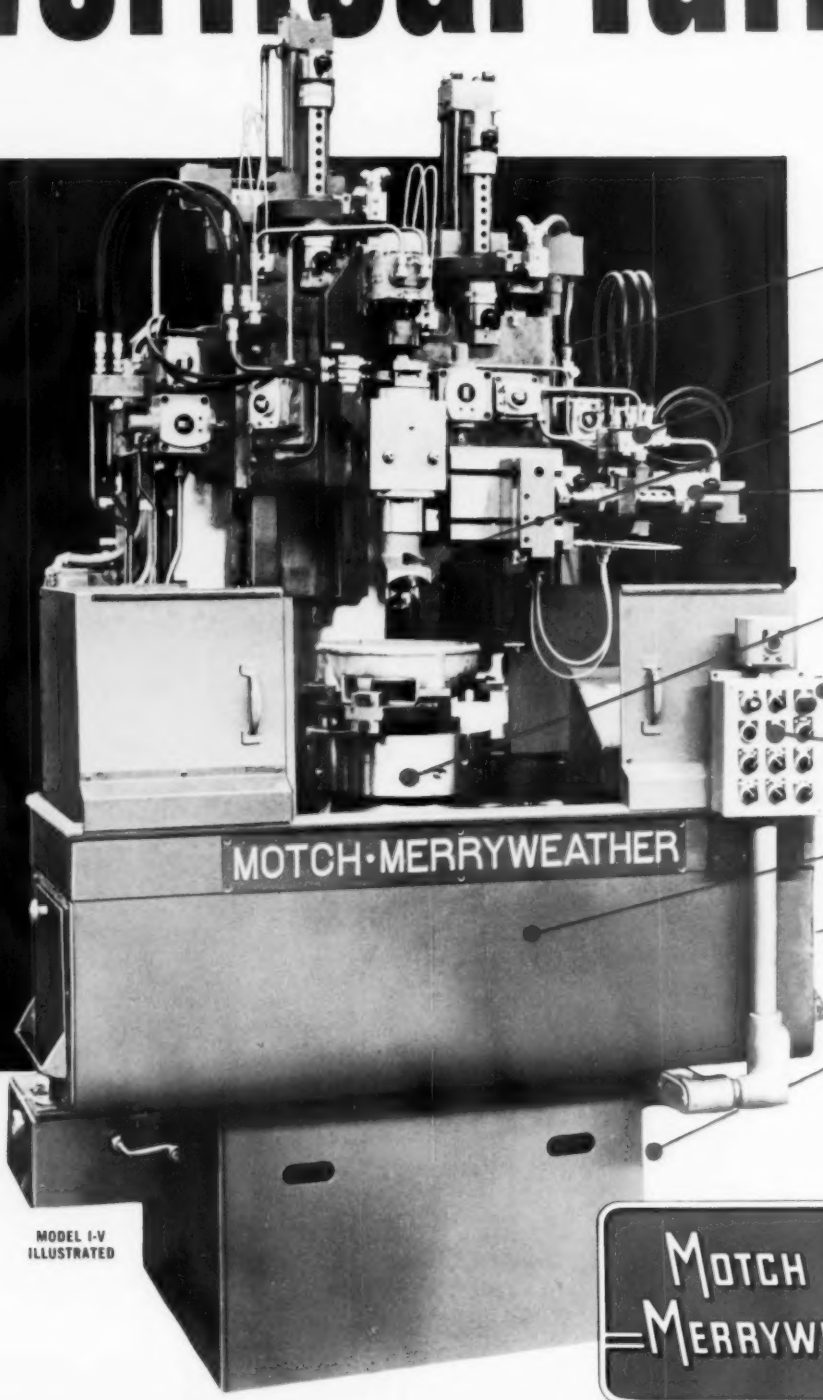
Operation #1 — chuck on motor bosses in 4-jaw chuck:
Rough turn 13" Dia. O.D.
Rough bore to 3.936 Dia.
Fin. bore to 7.040 Dia. — Time: 3.7 min.

Operation #2 — Reset tools:
Fin. turn 13" Dia. O.D. — Time: 1.7 min.
Fin. bore 3.9369 Dia. — Time: 6.2 min.
Total Time: 11.6 min.

NEW WAY

A Motch-Merryweather Model I-V Vertical Turner does all of these operations at one chucking and in one continuous cycle in 46 seconds!

Vertical Turner



RIGID CAST COLUMN HOLDS TOOL POSITION ACCURATELY

ALL HYDRAULICS EXTERNALLY MOUNTED

TOOL SLIDES MOUNTED ON HARDENED AND GROUND WAYS

TOOL POSITIONS EASILY CHANGED

TREMENDOUS TURNING POWER AT THE SPINDLE SPINDLE RUN-OUT HELD TO .0002"

HAND-HIGH CONTROLS

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CHIPS STAY CLEAR FOR EASY REMOVAL

SIMPLE, AUTOMATIC, SEQUENTIAL PROGRAMING

BASES OF HEAVY INTERNALLY-RIBBED CAST IRON OCCUPY 50% LESS FLOOR AREA

ALL COMPONENTS CAN BE ASSEMBLED AS DESIRED OR CHANGED AT WILL

MODEL I-V ILLUSTRATED

MOTCH AND MERRYWEATHER

1250 East 222nd Street CLEVELAND 17, OHIO

Illustrated above are only a few of the many different sections in the standard range held. In point of fact, almost any practicable shape can be supplied on request.

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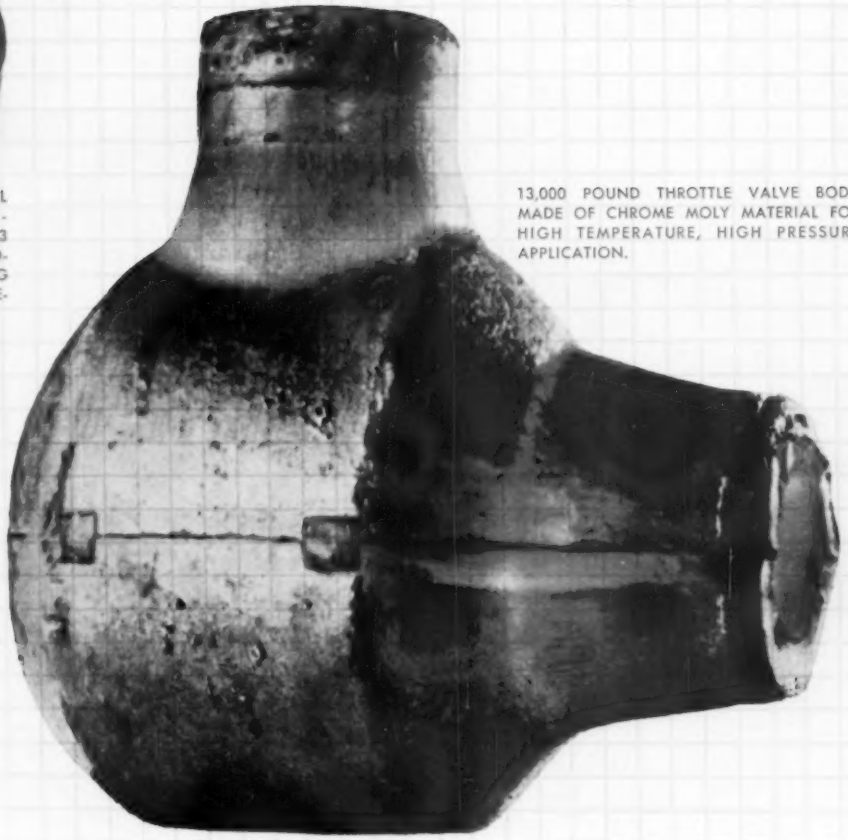
Have you received your current copy of The Albion Machinery Catalogue? If not, write for one today. This catalogue contains a comprehensive stock list of all new and secondhand Plant and Machinery, including Machine Tools, Contractors' Plant, Generating Sets and Pumps. It is regularly brought completely up to date and reprinted.

IN INCHES

JET ENGINE TURBINE WHEEL MADE OF A-286 MATERIAL WEIGHING ABOUT 13 POUNDS—FILLS ONE OF TODAY'S MOST DEMANDING APPLICATIONS FOR A PRECISION MEMBER.

13,000 POUND THROTTLE VALVE BODY MADE OF CHROME MOLY MATERIAL FOR HIGH TEMPERATURE, HIGH PRESSURE APPLICATION.



IN INCHES

EXTREME SERVICE COMPONENTS FOR JET ENGINES, GUIDED MISSILES AND NUCLEAR POWER PLANTS

REFRACTORY MATERIALS FOR SERVICE TEMPERATURES TO 5000° F—EXOTIC METALS AND MANY OTHERS.

CAMERON'S NEW VIEW OF FERROUS FORGINGS

Cameron forgings are not like other forgings. In the tradition-bound world of metal working they possess new properties, better quality and unusual shapes. They have opened new design vistas when high stress, high temperature or large intricate components were a concern. In less demanding applications also, benefits have made their appearance in the form of easier machining, less fabrication and geater strength, resulting in less material and lighter weight.

Cameron forging technique requires a complete operation from molten steel to final inspection. Presses, furnaces and auxiliary equipment of our own design give complete quality control and independence in production schedules.

If Ferrous forging design, produceability or purchase is your responsibility and unusual demands—economic or physical are your problem, write, call (Houston OVerland 6-5511) or come by.

Over ten years of successful case histories and a staff of competent specialists will give you a new view—help you get the most for your forging dollars.

Cameron

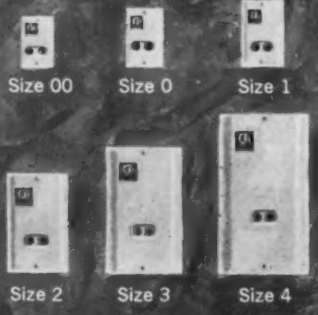
IRON WORKS, INC.

SPECIAL PRODUCTS DIVISION
P. O. Box 1212, Houston 1, Texas

Smaller! About 20% smaller than Size 0 Starters. Just 5 3/4" wide, 7" high and 4 3/16" deep.

Convertible! Carried in stock with three cover options or easily converted in field from "reset" only to "start and stop-reset" or "three-position selector switch." Kits at optional cost.

Broad line!



A new addition to the famous three star line

New! Save space and money with Cutler-Hammer's Size 00 A-C Magnetic Starter

Takes up to 20% less space... costs 18% less than Size 0 Starters. Now you get two big new bonuses in control selection . . . less space and less money Both with the all new Size 00 Starter.

Before, you had to use a larger starter in applications where it really wasn't needed. But, now you can use the Size 00 in about 40% of the applications where the Size 0 is usually used.

The new Cutler-Hammer Size 00 Starter performs to the same high standards you get from all Cutler-Hammer Starters. And, you still get vertical, dust-free contacts which add so much to more reliable starter performance. Your choice too, of 2-coil or 3-coil overload protection in the same small enclosure.

The Bulletin 9586 Size 00 Starter can be used on any general application. Its maximum horsepower ratings: Three phase: 208/220 volts, 1½ hp. 440/550 volts, 2 hp. Single phase: 115 volts, ⅓ hp. 230 volts, 1 hp. It's available open or in NEMA 1 enclosure. Send for Pub. LO-40-N246.

Why you get more from Cutler-Hammer. New things are happening at Cutler-Hammer—new, better products, new engineering ideas and talent, new plant capacity. We're on the move. And, we'd like to show you how we could help you in any electrical control problem. Contact the nearest Cutler-Hammer distributor.

WHAT'S NEW? ASK...

CUTLER-HAMMER

Cutler-Hammer Inc., Milwaukee, Wisconsin • Division: Airborne Instruments Laboratory • Subsidiary: Cutler Hammer International, C. A. Associates: Canadian Cutler-Hammer, Ltd.; Cutler-Hammer Mexicana, S. A

if your twin problems are

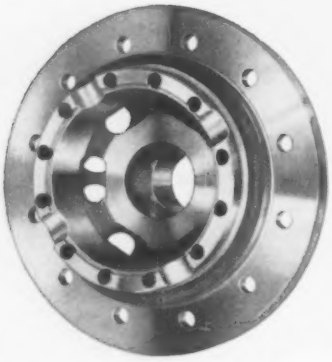
product improvement

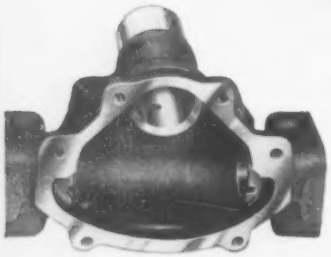
and

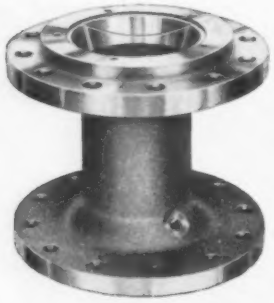
cost reduction

NATIONAL HTM CASTINGS

are the answer







HTM is strength . . . toughness . . . wear and fatigue resistance . . . non-seizing. HTM is higher machinability than B1112 steel . . . it's closer as-cast tolerances that can reduce or wipe out machining operations.

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Roebling high carbon flat spring steel is used for a wide variety of parts.

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They are qualities that contribute immediately and directly to *your* increased production rates and decreased rejects.

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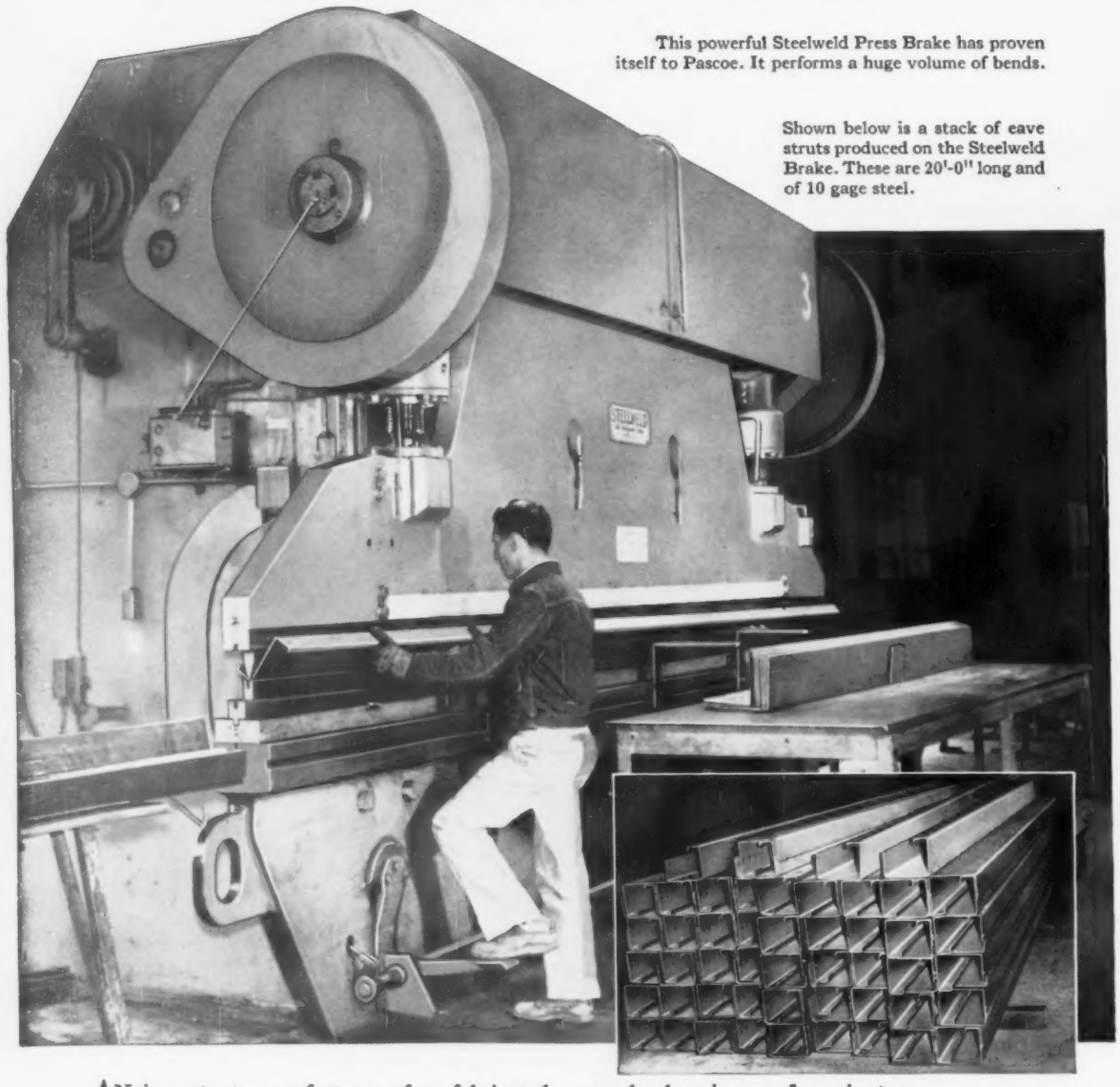
STEELWELD BRAKE
AIDS PASCOE BUILDING PRODUCTION

This powerful Steelweld Press Brake has proven itself to Pascoe. It performs a huge volume of bends.

Shown below is a stack of eave struts produced on the Steelweld Brake. These are 20'-0" long and of 10 gage steel.



AN important manufacturer of prefabricated steel buildings on the West Coast, the Pascoe Steel Corporation, Pomona, California, keeps their Steelweld Press Brake going full tilt in order to keep up with the production schedule.

The brake normally handles steel up to 20'-0" x 3/16", although occasionally 1/4" metal is formed. It has the speed and power to produce sharp accurate bends at a fast rate.

Despite all the work put through, only the meagerest amount of maintenance is required. For instance, the clutch has had to be adjusted only once, every eight-month period and this can be done in very few minutes.

Pascoe builds a complete line of pre-engineered buildings which are used for warehouses, light manufacturing, grain storage, auditoriums, aircraft hangers, etc.

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NOW— Aircomatic® welding anywhere with Airco's new MIGet Gun ...backed by the *most experience*

Want to weld atop a tank, on a mast or a derrick — without carrying around a pallet-full of equipment? The all-new MIGet Gun lets you weld in such out-of-the-way spots, with Aircomatic quality. It's a metal arc gas shielded tool that's perfect for such jobs, or for making numerous short welds — in aluminum, stainless, mild steel, etc. — at remarkably low cost.

Airco also produces a complete line of manual and automatic gas shielded arc welding equipment — Heliwelding for light and medium gauges, Aircomatic for heavier gauges and for cutting . . . and also everything you need in gas welding and cutting equipment, industrial gases, arc welders. Call your nearest Airco office or Authorized Airco Distributor. Look in your Classified Telephone Directory under "Welding Equipment and Supplies" for your nearest Airco representative.

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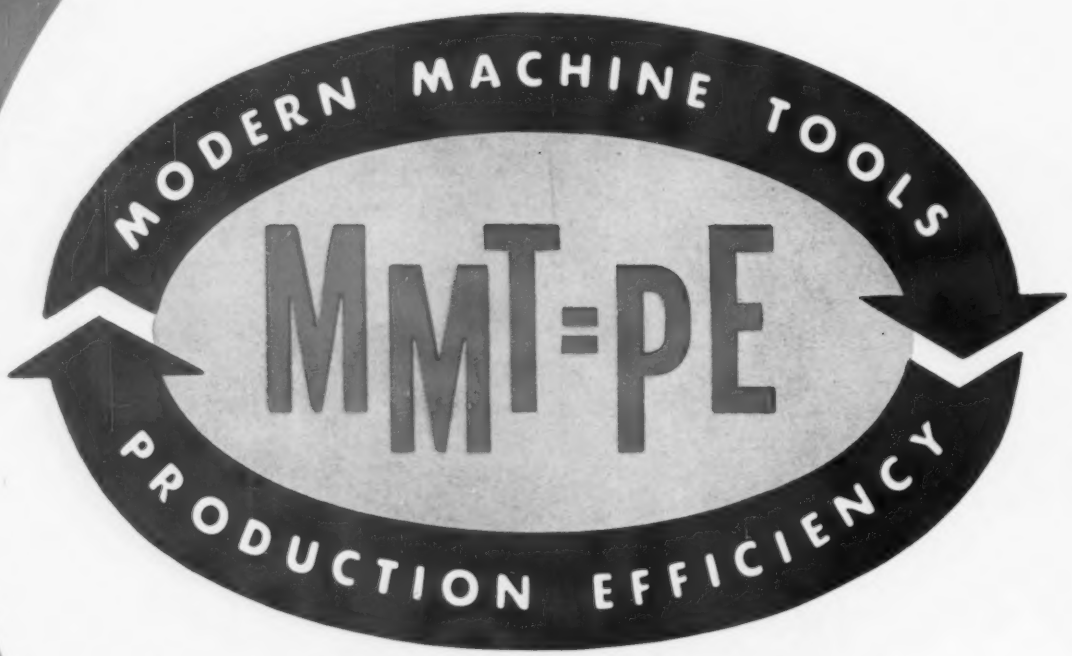
SOLVE YOUR



LANDIS *Machine* COMPANY

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THREADING PROBLEMS IN CHICAGO

The coming Machine Tool Exposition in Chicago, September 6-16, offers you a personal on-the-spot opportunity for solving any day-to-day problems you may have in the production of THREADS . . . . .

NEW EQUIPMENT— see the *new* LAN-NU-ROL Thread Rolling Machine in a completely automated threading operation, featuring automatic bar feeder and receiver unit.

NEW METHODS— see the *new* LANHYROL Thread Rolling Machine in the unique roll-straightening operation—duplicating the one now producing 4500 parts per hour in the plant of a large automobile manufacturer.

NEW IDEAS— Let LANDIS Engineers tell you about the untapped possibilities for production and profit with the *only* complete line of Thread Rolling Equipment—Machines, Attachments, and Heads!

and-IN ADDITION— there will be Thread Cutting and Tapping equipment in operation producing threads in both conventional and unusual applications. And—the complete line of the World's Largest Selection of Threading Tools will be displayed for your inspection.

DON'T MISS THIS wonderful opportunity at Booth 432 for a personal give-and-take discussion of your threading operations. Trained Threading Engineers will be available throughout the Exposition to analyze your problems and make suggestions for improving quality, increasing production, cutting costs.

583C

FOOTE BROS. introduces a FAN-COOLED

- High load carrying capacity
- Super-efficient 2-way cooling for higher thermal ratings
- Unlimited mounting positions
- Automatic and positive lubrication
- IN STOCK for immediate delivery

- 12 sizes—Center Distances from 1⅛" to 8"
- Rated to NEW AGMA Standards
- Ratios from 5:1 to 70:1
- Output torque to 46,000 lb. in.
- Input capacities from .01 to 66 HP

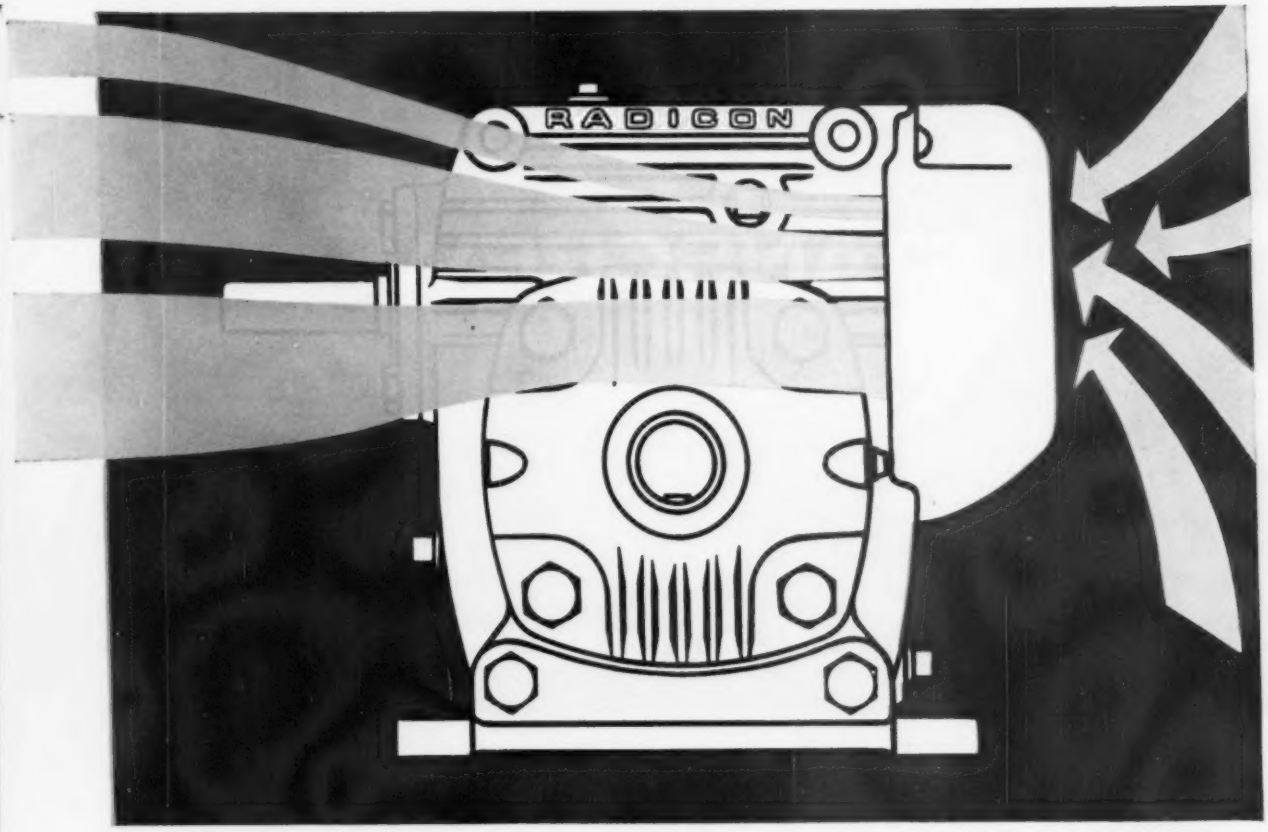
Foote Bros. RADICON Worm Gear Reducers incorporate *totally new* concepts of speed reducer design and construction. From the inside out and top to bottom, they embody years ahead thinking to provide users with more efficient, more versatile right angle power transmission in minimum size units.

Gear accuracy and surface finish, bearing and shaft design, positive lubrication, extreme efficiency controlled cooling, the selection of materials and precision manufacturing techniques—all reflect careful attention to detail that results in higher load carrying capacity and maximum service life.

These outstanding new fan-cooled worm gear reducers are available now—carried IN STOCK by Authorized Foote Bros. Distributors for IMMEDIATE DELIVERY. See them soon. Get complete details on the performance, versatility, and service life they will bring you. Write for RADICON Catalog.

UNLIMITED MOUNTING POSITIONS

COMPLETELY NEW and ADVANCED line of WORM GEAR REDUCERS



RADICON Reducers operate in a STREAM OF AIR for maximum thermal efficiency

Advanced design of RADICON Worm Gear Reducers and their high efficiency radiation and convection cooling for controlled transfer of heat to the outside air, permit *identical* thermal and mechanical ratings in most cases. For infrequent or intermittent service, thermal ratings can be ignored.

A moving stream of air, induced by the maximum diameter fan, forcing high velocity cooling air along horizontal channels formed by the external ribbing, dissipates radiated heat to hold the Reducer's temperature rise to a minimum. Cooling is equally efficient at any mounting position.

FOOTE BROS. F B **GEAR AND MACHINE CORPORATION**
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POWER TRANSMISSION DRIVES

STANSCREW

Symbol of a new concept

in fastener service

American industry is learning Stanscrew means extra values.

This symbol personifies a trained staff of fastener specialists. Their technical assistance can often help you reduce fastener and assembly costs.

It means extra quick deliveries from complete inventories maintained at three conveniently located plants . . . over 5,000 different types and sizes to assure a broad selection for the great majority of your requirements . . . and, above all else, fasteners of consistently high quality.

Although it first appeared in 1958, the Stanscrew trademark represents a wealth of fastener experience. For it combines the technical skills and specialized facilities of three major manufacturing divisions of Standard Screw Company, each an honored name for more than 80 years. They are:

THE CHICAGO SCREW COMPANY, BELLWOOD, ILLINOIS
HARTFORD MACHINE SCREW COMPANY, HARTFORD, CONNECTICUT
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For fasteners, specify Stanscrew. For other needs of home and industry, Standard Screw divisions also produce:

Moen single-handle faucets • *Hartford textile spindles*
Roosa Master fuel injection pumps • *Chicago tappets*

Each division also provides a complete design and manufacturing service for cold headed and screw machine products.

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FHA MORTGAGE INSURANCE APPLICATIONS JUMP 9 pct in June. This seems to bear out forecasts of a U.S. homebuilding spurt. But government experts aren't saying so yet. Officials say a one-month spurt doesn't make a trend. The prospect remains, however, for a good second half in 1960 for home building. In June, 129,500 housing starts were reported by the Commerce Dept. This compares with 153,300 starts in June 1959.

CONSUMER SPENDING ROSE 5.8 pct in 1959. This is far above the average yearly gain of 3 pct. Total consumer spending last year hit a record high of $313 billion. Biggest gain was in the automotive field. Spending for transportation, mostly new cars, jumped 15.4 pct over 1958 to hit $39 billion.

CONSTRUCTION MACHINERY AND EQUIPMENT shipments in 1960 are expected to total about $1.7 billion, according to a midyear review by the Commerce Dept. The record total of $2.4 billion in shipments was reached in 1956, the 1955-60 average (excluding 1957) being $1.9 billion.

JUNE ORDERS FOR NEW FREIGHT CARS dropped to a bottom-scraping low of 321. This compares with June 1959 orders for 8054 cars.

PRIMARY MARKET PRICES OF METALS and metal products declined 0.2 pct in June, according to the Dept. of Labor. This decline is in line with general price movements in all other commodities for the month. While scrap metal prices led in pulling down metal prices, finished steel edged off for the first time since last fall.

NET NEW ORDERS FOR MACHINE TOOLS showed mixed signs in June. Orders for cutting type tools rose from $38 million in May to $43.2 million in June. Foreign orders accounted for $17.8 million of the June volume. Orders for metal forming type tools remained the same in June as in May, $11.8 million.

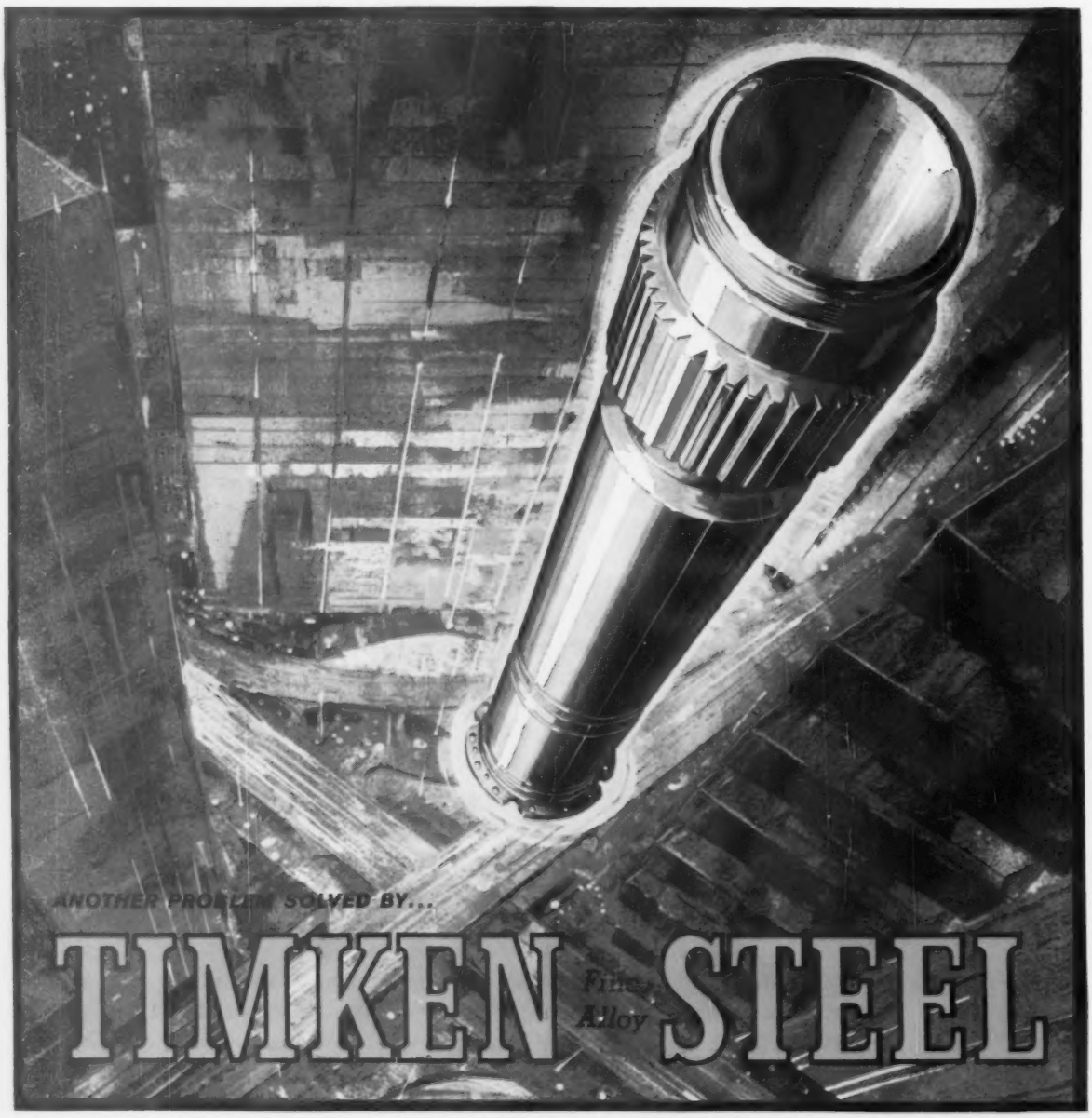
INDUSTRIAL MATERIALS HANDLING EQUIPMENT increased nearly 28 points in May, according to the monthly index of the Material Handling Institute. The index shows that the dollar volume in May was at 150.33 (1954=100). This compares to bookings of 122.4 for April. The sharp increase is attributed to heavy orders from automotive companies in anticipation of model changeovers.

How steel tubing saves weight in helicopter...in budget, too

Shown below is the main rotor shaft of a new model helicopter. Because it was hollowed out of solid steel bars to save weight, it was costly to make. After machining to thousandths of an inch accuracy, previously undetected steel flaws showed up. One out of every five parts had to be rejected.

Timken Company Metallurgists were consulted. After careful study, they recommended a special analysis of Timken® seamless steel tubing. Savings began immediately. Because the hole was already there, no drilling was required. Steel was saved. And with the extra advantage of uniform forged quality in Timken seamless tubing, rejects of finished parts were practically nil.

Let us help you cut your costs, get better quality finished products. Our engineers will recommend the most economical tube size for your hollow parts jobs, one guaranteed to clean up to your finish dimensions. **When you buy Timken Steel you get:** *1) Quality that's uniform from heat to heat, bar to bar, order to order. 2) Personal attention from the experts in specialty steels. 3) Over 40 years experience in solving tough steel problems.* The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits.*



TIMKEN ALLOY STEEL AND SEAMLESS STEEL TUBING ARE AVAILABLE FROM STEEL SERVICE CENTERS IN 44 CITIES IN THE UNITED STATES

Critical Issues Between GE, IUE

A major labor relations clash is shaping up as electrical manufacturers start negotiations.

GE is attempting to hold the line and bargain on the issues as the company sees them. More is at stake than cents per hour as talks start.—By G. J. McManus.

■ Labor and management in the electrical industry lined up last week for what could be the most critical contract negotiations of recent years.

Talks bring together the clashing concepts of central union power on the one hand and individual rights with management leadership on the other.

Poles Apart—The sessions start with bargaining parties in sharp disagreement on most specific issues. Labor emphasizes job security in its proposals; union leaders say productivity and economic benefits must be related to the need for job protection and jobless pay.

Management approaches talks with the conviction that costs must be held down. To keep costs competitive, say the companies, excessive pay hikes must be avoided and every effort must be made to increase productivity.

GE Pioneering—In resolving the immediate issues, negotiations could decide the more fundamental questions. In its labor relations is General Electric Co. the last of an old line or the start of a new one? Are current notions of unionism to be revised or established more firmly?

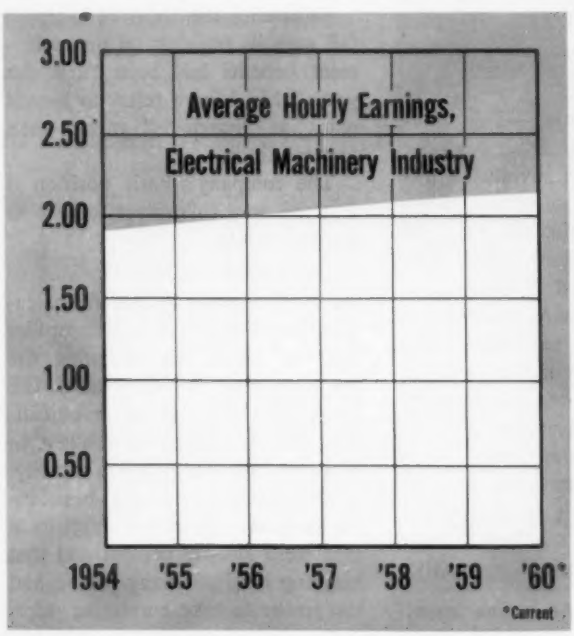
Although both sets of issues are coming to a head, talks began on a relatively calm and hopeful note. Last month, General Electric and Westinghouse Electric Corp. received the contract proposals of the International Union of Electrical, Radio and Machine Workers (IUE).

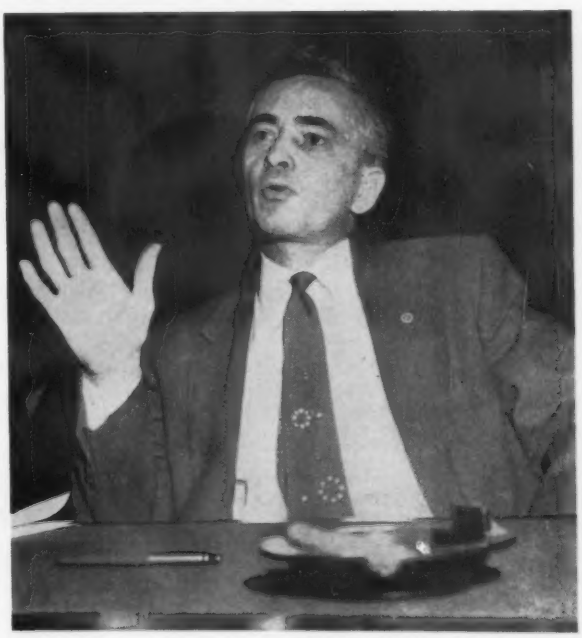
The union program called for a 3.5 pct pay increase and a wide range of fringe benefits. In addition, it demanded unemployment pay and measures to protect jobs. At the same time, IUE suggested talks begin before the scheduled date in August.

Reaction to Demands—General Electric termed the union demands "astronomical," saying they would cost more than $500 million over a two year period. However, both GE and Westinghouse agreed eventually to an early start for discussions.

Last week GE met in New York with James B. Carey, IUE president. Westinghouse scheduled Pittsburgh meetings with IUE representatives for early August. Meetings were arranged without the usual belligerent exchanges. The cordial

Will Electrical Wage Rise Continue?





mood held up fairly well at initial GE talks.

"This looks good to me at this stage," said Mr. Carey. He expressed hopes that a contract could be negotiated long before the Oct. 1 deadline.

No Common Ground—Philip D. Moore, top negotiator for GE, was more reserved in his optimism. Mr. Moore indicated the opening session had passed without difficulty. He added, however: "No common grounds for resolving cost questions have been reached."

Later talks ripped away any appearance of amiability. Mr. Moore walked out of Thursday meetings, charging Mr. Carey with profane and abusive treatment. According to GE, the union outburst came when local leaders were being questioned on job security matters.

Same Old Carey—Mr. Carey dispelled any speculation that he had mellowed—"I am the same old Carey and I haven't changed a bit."

In Westinghouse talks, union and company officials are non-committal about prospects. The company says it is just 'listening' to proposals. A top union official says it is too soon to get a reading on negotiations.

In other contract situations, there is little open activity. Four major unions are loosely allied with IUE for bargaining purposes. The independent United Electrical Workers (UE) has its own contract to negotiate. UE has proposed a 35-hour week in its package.

However, interest centers on talks between General Electric and Mr. Carey's IUE. These involve the biggest single bloc of electrical workers; IUE claims dues paying membership of 68,000 at GE and representation of 100,000.

GE Philosophy—Moreover, the GE sessions provide a clear, strong display of basic management views. For the past 14 years, General Electric has been developing and applying a unique philosophy of labor relations. The company has centered its attention on the individual worker rather than the union organization.

"We are neither pro-union nor anti-union," says GE. "We are pro-employee."

In theory, this doctrine does not sound too radical. Many industrialists talk along similar lines. But few companies have put their thinking to work with the determination and energy of GE. The electrical company hits employees with a steady barrage of information. Employees are contacted in the home, in the community and in the plant.

Successful Communications—"No question about it," concedes an IUE man, "GE has the most effective communications program in all industry."

The company picks up all union challenges or charges, however small; it comes back with a fast, open answer. GE was one of the few companies to come out openly for Right-to-Work laws. It never hesitates to criticize union leaders to union members.

Showdown Coming—This indicates how determined GE has been in its push to get individual workers to think for themselves. However, current negotiations may provide the real showdown. IUE leaders have moved to consolidate their power. The union constitution has been changed to provide that a strike may be called with a straight majority vote of the conference board. Formerly a two-thirds majority was required.

Another new provision permits the union to appoint an administrator in the place of any local leader who is held to be acting improperly.

Union Polled—As a final measure to close ranks, IUE polled its members prior to talks. Workers were asked to indicate what provisions were considered most important in the new contract. According to the union, the response showed job security as the most important by an overwhelming margin. GE officials say the wording of the questionnaire was not clear and the results are questionable.

But even without any strengthening of Mr. Carey's position, current talks figure to be difficult. General Electric says it is determined to avoid an inflationary settlement.

GE does not say how much of an increase would be justified. It mentions a figure of 2.1 pct as possibly the true productivity gain over a long period. The point is made that an individual company cannot be singled out as the basis for productivity increases. A broad index must be used, says GE, because the wage pattern established by the most efficient companies will be applied to others who are less efficient.

Benefits in Question — In any case, it is clear the bargaining parties are far apart on the issue of how much proposed benefits would cost and should cost. Mr. Carey says the union program would cost about one-third of the $500 million estimate of the company. He calls for a straight wage hike of 3.5 pct.

Regarding the form of benefits, GE says its position on unemployment benefits has been "firm for years." Mr. Moore refers to benefit plans as "bandaids" rather than real solutions.

The company's basic position is that the way to protect jobs is to increase sales.

Local Problems—Discussions so far have already provided indications that fundamental philosophies may be tested. In accepting the union proposal for early talks, GE suggested that local union officials and local managers be brought in to discuss the matter of job security.

Mr. Carey resisted any broadening of talks. He said enough local men were already present and that only top level company people had the power to take corrective steps.

What's Coming In Labor?

This is the last of a four-part series on developments in labor relations.

Previous parts covered current settlement patterns, long-range employment problems, and the outlook in steel labor.

Copper Banks on New Research

R & D Program Aims at New Uses and Wider Markets

Copper industry believes it must develop new uses for its product.

New program is organized to widen copper utilization. Stainless copper is one of the first goals.—By F. J. Starin.

■ Leaders in the copper industry want stability and are working to achieve it. They're also investing in research for new markets.

In the past six months the copper industry has maintained a steady price. It has done this despite strikes and a second-quarter oversupply. Now attention is being focused on research for the future.

Recently, Dr. Charles H. Moore was appointed technical director of the Copper Products Development Assn. He was formerly executive director of research and development for P. R. Mallory and Co.

Dr. Moore has no practical experience in the copper field. Yet he faces the task of opening new markets, developing new products and regaining copper's sagging vitality as an industry.

High on the agenda for CPDA is the development of stainless copper. This, it is believed, would gain immediate acceptance. It would be used for architectural and building products, hardware, furniture, and cooking utensils.

The new director sizes up his task this way: "There is a limited market for copper as it is now. We must change it or alter it, coat it and develop new techniques if we are to increase its markets."

He sees a minimum of three years of research before any tangible results.

Already several contracts have been awarded. Southwest Research Institute in Texas is working on a study. It hopes to find uses for copper in the transportation industry. Battelle Memorial Institute is looking for new uses of copper in the construction industry. Other research groups are studying other phases of the problems and even more will soon undertake the task.

Dr. Moore contends that it's best to use different research organizations on the study. He says he doesn't believe in making any one man or group "responsible for the success or failure of a major project."

He sees the project as worldwide. In the past he has set up research projects in Austria, Germany and Switzerland and fully intends to take advantage of this experience. It is possible, too, that major African producers will join the CPDA when political problems subside.

The current copper picture, though steady, is muddy. Charles Cox, president of Kennecott Copper Co., points out that his company is working a 7-day week and selling all it can turn out. But he admits that a large percentage of Kennecott's production is going to Europe.

The general feeling is that many consumers are well stocked and that copper consumption is not matching shipments.

In addition to the African output, there are several major unknowns facing producers. Among these are buyers who have been fence-sitting during the first half; and the buying intentions of the automobile industry.

In any case, copper leaders are banking on research to open the new markets so vital to the industry.

DR. C. H. MOORE: "There's a limited market for copper as it is now."

Appliance Market Cools Off

Air Conditioners Sell Well; Refrigerators, Others Lag

Appliance makers are doing their best to trim large stocks that overhang the market.

They hope to have them under control soon, get production rolling again with new models in September.—By K. W. Bennett.

■ Appliance makers are grim about the remainder of the third quarter.

With July already gone, they expect little change in August manufacturing levels. They'll continue to cut back inventories. First real gains in appliance business at the factory level won't come until September.

Business trails January forecasts by about 20 pct. Compared with last year, first half business is down about 10 pct. An appliance spokesman comments: "Third quarter is an enigma. We aren't making any statements about the outlook. We're gun-shy. We think business will move up rather strongly in fourth quarter. But don't quote us."

Price Cutting—Despite previous comments of "no more price cutting," a series of price slashes of as much as $30 to $40 per refrigerator has staggered the industry. Refrigerator inventories at the beginning of this month were figured at 950,000 units as compared with 750,000 units one year ago.

One manufacturer notes: "The inventory is being cut at the rate of 30,000 units a week, but it'll take six weeks to whip it into line." Refrigerators are the industry's major problem.

Home laundry equipment is in much better shape. It should be at optimum levels by mid-August. Kitchen ranges, according to several manufacturers, are in relatively good shape right now.

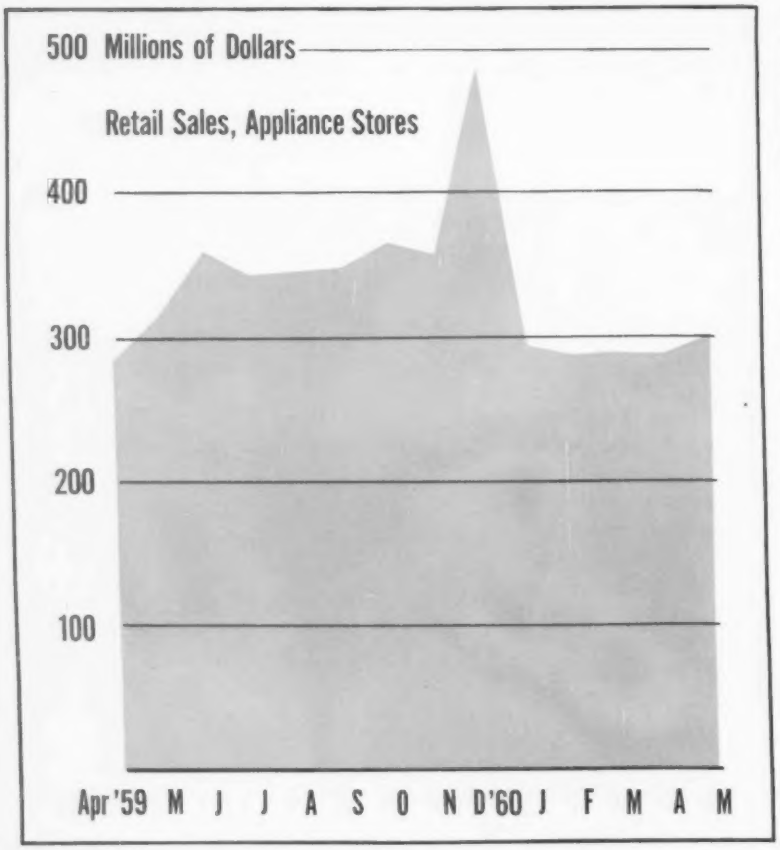
Good and Bad — The question puzzling appliance men: Why aren't things better?

Government figures on consumer hard goods spending, point to record levels for first half—up 2.2 pct over last year. Home laundry equipment, for example, rose in April after a dropoff in March. Sales were up 3 pct in May, and June figures, due this week, will show a 14 pct gain. The problem? June will still be 17 pct under last year. And first-half totals lag the first six months of 1959 by 10 pct.

But the news isn't all bad. Television receivers aren't usually classified major appliances. But they're the biggest consumer item marketed by appliance distributors. Retail sales were over $1.3 billion last year, and TV sales are up 7 pct in first half 1960. A major manufacturer has been reducing its inventory since May—despite the fact that its sales are 20 pct over last year.

Cooling Off—Room air conditioner sales reached $485 million in 1959. At the close of first half, air conditioner sales were up a sharp 9 pct, compared with a 7 pct inventory gain through May. These are preliminary figures. But at least one major air conditioning equipment maker reports the advance in his first half sales exceeds these gains.

Will Appliances Rebound?



On the down side: Home laundry equipment in 1959 grossed $1.3 billion in retail sales. It ranks with TV as a top income producer. Cumulative business for the year: Off 10 pct. As of July 1, laundry inventories are up 50 pct from last year.

Refrigerator sales totaled $1.2 billion last year. Through May they trailed a year ago by 3 pct in May, and they've been slipping at the manufacturing level ever since.

Extended Vacation—Ranges are a $750 million item. They sell at a fair pace through all of the year. But first half sales this year are off 6 pct. Inventories are coming down, prices seem firm, and there is at least a mild seasonal bulge in sales expected at the end of third quarter.

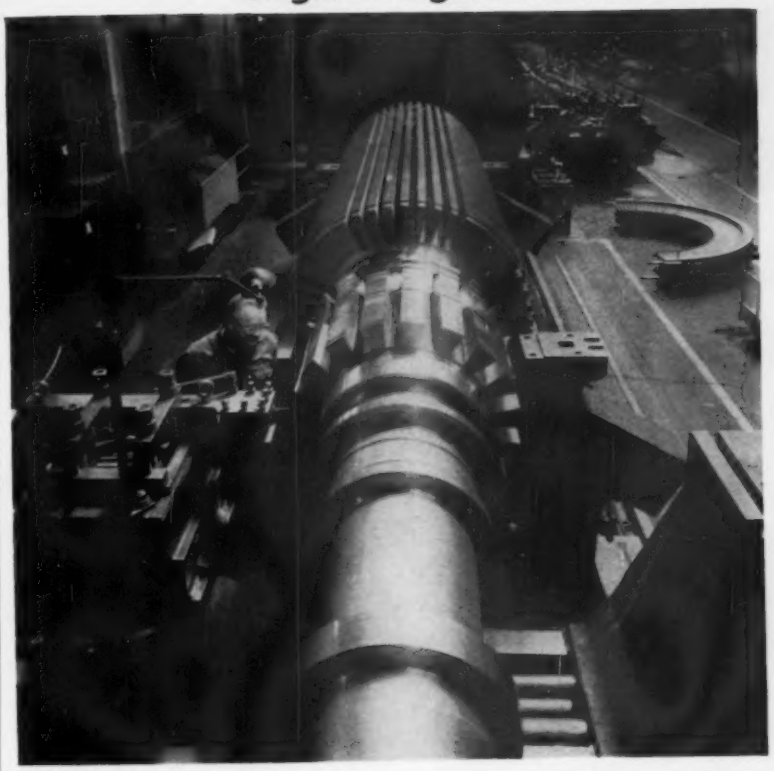
The consequences: One major appliance maker will double its August plant vacation shutdown, from two to four weeks. General Electric Co. has already announced an August layoff for 900 workers (8 pct of the workforce) at Appliance Park, Louisville, Ky. Other top appliance makers indicate low building levels until at least September.

In September, an upswing in appliance activity is expected. New models will move out to the distributors and dealers. This will require a pipeline filling operation that requires higher manufacturing levels. At the present rate of cutting finished goods inventory, all stocks should be down to the nub in the big dollar appliances. The stiffest manufacturing cutbacks of the year occurred in July, will be duplicated in August.

Some Doing Well—However, a number of appliance makers have been doing quite well. They're reducing inventories much more rapidly than has the appliance industry generally. A general upswing in appliance activity would force them to boost their present skintight inventories. Admiral Corp., Maytag Co., and Whirlpool Corp. are examples.

Among the top dollar earners, only air-conditioning and refrigerating equipment will have passed their seasonal sales peak by September.

Brighter Lights for New York



POTENTIAL POWER: This 36-ft long vacuum cast, nickel-molybdenum steel forging for a 4-pole generator rotor is machined on a 144 in. lathe at Allis-Chalmers West Allis Works. It will be part of fully supercharged generator for Consolidated Edison Co. of New York.

Big Steel Tonnage Set for Highways

About 700,000 tons of steel will go into the $2 billion Federal highway construction program for the two years starting next July 1.

The $1 billion a year put up by Congress and signed into law by President Eisenhower will mean the annual use of close to 350,000 tons of structural steel, reinforcing steel, corrugated pipe and miscellaneous steel for the roads project.

The government says 300 miles of primary, secondary and urban highways will be built in this phase of the project. Also, about 10 million barrels of concrete will be used.

The roads money is $125 million a year more than requested by the Administration. About $100 million a year of the extra money will go into states with high unemployment.

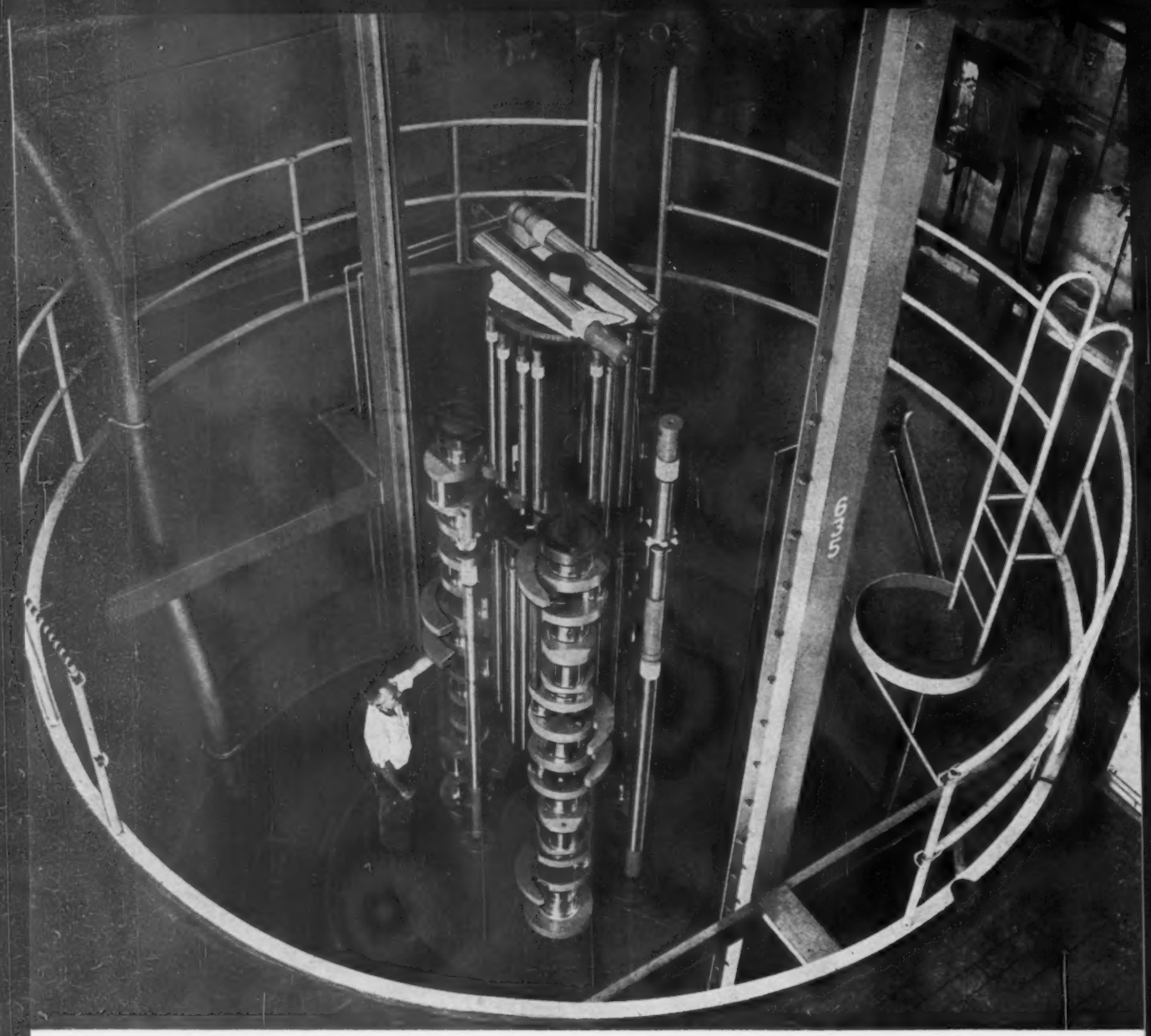
The $2 billion is part of the overall national highway building program begun four years ago.

Yearly steel requirements for new Federal highway construction program: Structural steel, 139,000 tons; reinforcing steel, 143,000 tons; corrugated pipe, 29,000 tons; and miscellaneous steel, 39,000 tons.

S-P Profits Drop

Studebaker-Packard Corp. reports income of $3,359,585 on consolidated sales of $178,052,136 in the six months ended June 30. This compares with sales of $209,816,771 and income of $12,073,281 in the same 1959 period.

Harold E. Churchill, president, says sales volume in the second quarter kept pace with the first three months. However, results were "adversely affected by higher marketing costs necessitated by strong competition."



WHO FORGES THE TOUGH ONES? . . .
and nitride-hardens them, too?

National Forge does it—with a nitriding installation that is one of the largest and most modern in existence. Now diesel crankshafts, pump eccentrics, compressor pistons and rods, gears, marine couplings, and many other machinery parts are not only *forged* at National, but *nitride-hardened* to add strength and reduce wear. Vertical nitriding furnaces like the one illustrated will accommodate forgings up to 16 feet in length.

National Forge also has its own basic electric melting facilities and produces all the usual types of nitriding steels, including the recently developed 5% nickel, 2% aluminum grade. For further information, write for bulletin NH-1058.

NATIONAL FORGE COMPANY

IRVINE, WARREN COUNTY, PENNSYLVANIA

NF 60-01

For more information on "the tough ones," and the machinery that makes them "best"—write for bulletin NFO

Welcome Bender

He Looks for the Answers

Mr. Bender heads the Research Institute for Advanced Studies. His work is in pure research.

The Institute and his job were created when it was discovered engineers had few new ideas with which to work.

■ Welcome Bender is the director of the Research Institute for Advanced Studies in Baltimore.

His job is unusual. Basically, his interest is pure, in contrast to applied or product, research.

And his organization is unusual. Although his group of 60 scientists work in almost any field of research, none is directly concerned with markets, or even uses, for whatever he may discover. Yet RIAS was established and is still supported to a great extent by The Martin Co.

How did this come about?

WELCOME BENDER: He sells pure research.

Nothing New — Explains Mr. Bender: "Back in 1954 The Martin Co. submitted designs for a new airplane, along with others, to the government. We didn't get the contract.

"That didn't bother the company too much. After all, we've lost competitions before. But what did bother us was the almost complete lack of excitement or enthusiasm among our own engineers on the project.

"We did some probing and found out why. The new airplane we designed was better than anything we'd previously done. But it really was nothing more than a perfecting of previous work we had done. There wasn't a new concept in the whole plane."

Lack of Ideas — The company decided there were plenty of engineers coming out of the colleges. But there just weren't enough new ideas for them to work on. Universities and philanthropists were just not able anymore to carry the load of basic research.

Martin bought an old mansion in suburban Baltimore, and Welcome Bender went after his staff.

"We don't care what a man wants to work in," he explains, "just so he has some original ideas and the drive to get the answers."

Space Farming — "For instance, we have a man doing some original work on photosynthesis. Maybe he'll discover principles that will help man grow his own food in space. But someone else will have to put it to work. We just want to know why and how. We are looking for knowledge, not products."

In the field of metallurgy, Mr. Bender's staff has discovered some interesting principles on the phenomena of dispersion hardening.

Anything RIAS discovers is available without strings to anyone.

Self Propelled — Mr. Bender's organization pretty well runs itself. There are no timeclocks and few rules. His main function is to put RIAS on a paying basis. He fears that if he continues to be supported by Martin he will be inevitably drawn into practical research.

He butted heads in Washington for several years to no avail. Then the Sputnik put him in business.

Now RIAS has 19 projects being sponsored by the government. This makes them about 40 pct independent.

More Action to Ease Money?

If business doesn't shake off its summer slump, there will probably be more moves to ease credit.

Some interest rates, reacting to the decline in borrowing, have been sliding off so far this year.

▪ You can probably look for more Federal action to ease money in the next few months.

It's a likely move if business doesn't improve after the usual summer slowdown. And political pressures between now and November will increase the prospect.

Up, Then Down—Recent moves by the Federal Reserve Board to thaw out credit haven't helped too much as yet. The most recent was a decrease in the discount rate—the rate the Federal Reserve charges member banks on their borrowing—from 4 pct down to 3½ pct.

This reduction, which came in early June, reversed the upward trend in the discount rate that existed since 1958. During that time the rate climbed from 1¾ pct, to 2, 2½, 3, 3½, and finally 4 pct in September, 1959.

In the first half of this year, FRB figures show, the rise in total bank loans was only half as large as in 1959. There were gains, between January and June, in some types of loans—to business, consumers, and nonbank financial institutions.

But these were offset, in part, by a dip in real estate loans and a large drop in securities loans. And, as noted, the first half increase in lending fell far behind first half '59.

Other Rates React—Lately, the interest rates on other borrowing—short-term commercial loans—have reacted to the dull credit market. With few exceptions, they have been sliding off since the start of the year. They dropped from a January level of 4¾ pct to 3⅝ pct in early July.

How important credit is to business is pointed up by the present inventory situation. One of the factors in the decreased activity is buyer caution.

Availability of supplies, a falloff in sales, and belief that prices will hold steady have encouraged buyers to hold down purchases. But tight money is also an influence. Higher interest rates and tight credit also discourage borrowing to build inventories.

Boost for Housing?—More liberal credit could help in another area—housing. Home construction declined in June, slightly below the May level, the Census Bureau says. The June rate of new home starts was about 15 pct below the rate of June, 1959.

There are several ways the FRB might act to further ease credit. They are: (1) Another reduction in the discount rate below the present 3½ pct; or (2) Lowering the reserve requirements for member banks. This would allow them to increase their lending capacity.

Do Personnel Tests Help?

▪ Are testing programs the soundest way to select employees? A big "no" comes from Lon D. Barton, president of Cadillac Associates, Inc., a Chicago-based placement firm.

Such personnel testing is a "corporate booby trap," according to Mr. Barton. His reasons?

Value Oversold?—"Testing companies, in many cases, have oversold the value and effectiveness of such programs. They have suggested, indirectly perhaps, that they can offer some magic formula insuring selection of the right man ten times out of ten."

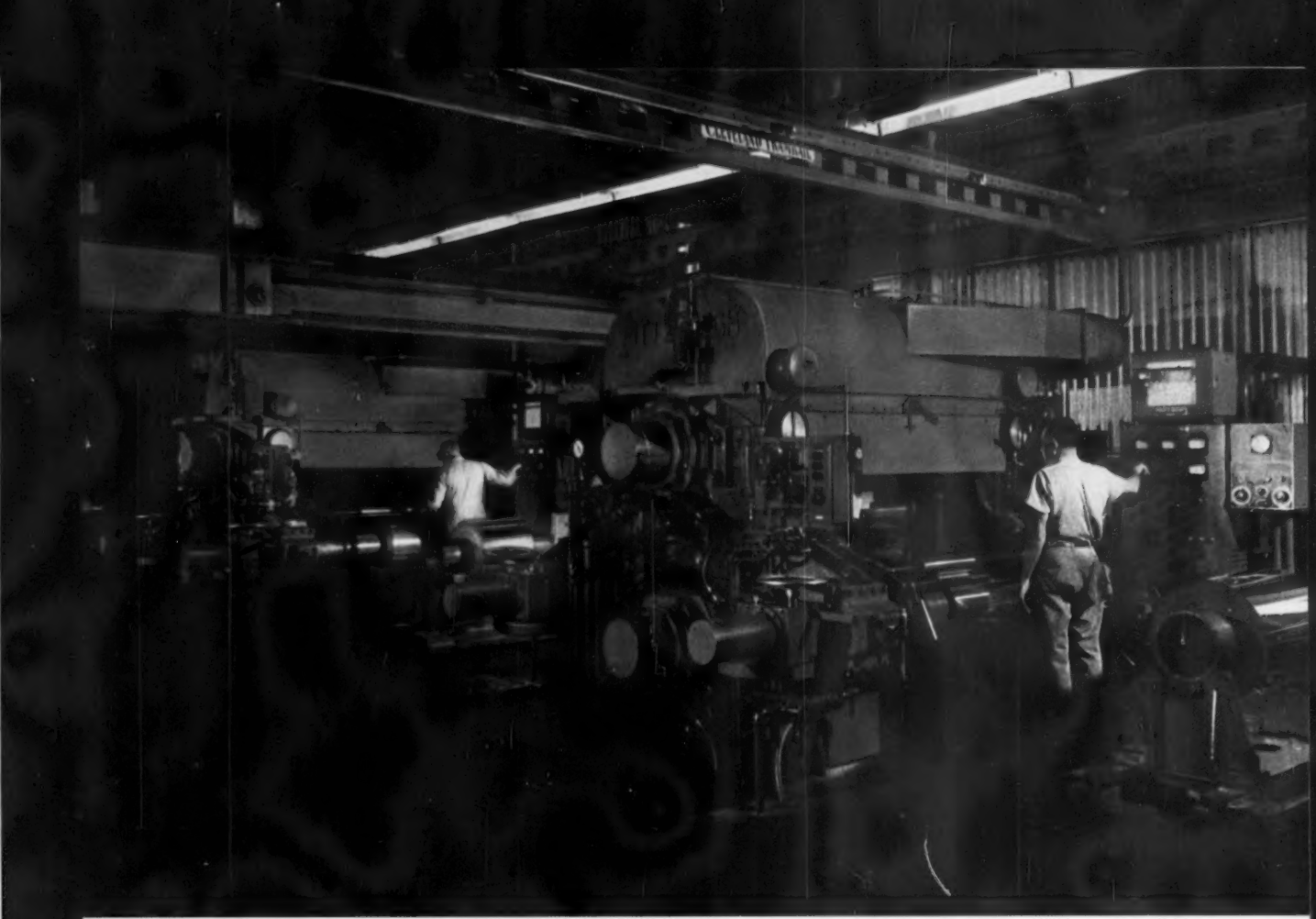
It's implied, he says, that management can no longer rely on personal judgement or reference checks to select manpower. In addition many testing firms play on the management uncertainty, even fear, that today's complex business demand extraordinary assurance they are making the right selection.

No Final Answer — Are testing programs of any value and do they have a legitimate place in personnel selection? Says Mr. Barton, "In my opinion, they are utterly worthless. So far as I know, no test has yet been devised which can give a potential employer the answer to the question 'Should I hire this man?' or to the far more important question, 'If I hire him, will he work?' "

U. S. Ends Fiscal '60 With Surplus

The Federal government wound up fiscal 1960 with a budget surplus of $1.1 billion.

This was $900 million higher than the predicted surplus that had been estimated earlier. Total budget receipts for the year ended June 30, 1960 were $78.4 billion. This was $10.1 billion above the 1959 total. Expenses in 1960 were $77.3 billion, down from the $80.7 billion in fiscal '59.



Precision Foil Mills in Action

at THE ANACONDA® ALUMINUM CO.

High quality aluminum foil as fine as .0002″ in thickness is now being rolled at speeds up to 2,000 feet per minute on these new 64-inch, four-high foil mills at Anaconda Aluminum, Louisville, Ky. Heavy demand for this material requires round-the-clock operation with minimum down time for maintenance.

Design features include a hydraulically operated roll stand to control pressure; a direct drive to permit variable work roll diameters ideal for research in producing metal foil; and X-ray equipment for automatic gauge control.

Contact PITTSBURGH for all your requirements in rolling mill equipment.

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564 FORBES AVE. PITTSBURGH 19, PA. • PLANTS AT GLASSPORT AND McKEESPORT, PA.

Forming this cup in the traditional manner takes five costly and time-consuming operations.

Precise metal forming simplified

PARISH ingenuity speeds production, cuts cost

The same cup . . . produced by Parish . . . takes only 2 operations through cold extrusion.

Even at its new lower cost, the Parish part is more accurate than those produced by the old-fashioned 5-step forming process. The difference is Parish experience and ingenuity . . . the ability to recognize that there's a simpler, faster, cost-cutting way to turn out high quality production in volume.

Look at the benefits! By streamlining this operation from 5 stages down to 2 . . . with the aid of the latest high-impact presses . . . Parish engineers cut the cost and time for tooling, doubled the rate of production, and delivered the parts at a new low price.

Parish facilities, ingenuity and skill may help you cut the cost of large and small parts requiring stamping, machining, heat-treating, welding, balancing and assembly.

Why not increase your margin of profit by writing Parish today? Your inquiry will receive prompt attention.

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AN IRON AGE SPECIAL REPORT TO MANAGEMENT

What the European Common Market Means to U.S. Business

By **David Rockefeller**—Vice Chairman, Board of Directors, The Chase Manhattan Bank, New York

For American business the European Common Market holds out both a challenge and an opportunity.

But most important it is a bold move to unite W. Europe and make it a stronger partner in the Western Alliance.

▪ Not long ago I made a trip through the Midwest, visiting with executives from some thirty or more manufacturing companies.

As a banker, I expected these discussions to revolve mostly around the various aspects of financial planning. But in the course of these conversations I couldn't help being impressed at how often one topic kept cropping up: The European Common Market.

Interest Grows—Such widespread interest in international matters hardly would have been in evidence a dozen years ago.

Except for a handful of internationally-oriented companies, most American manufacturers at that time were busy filling a seemingly insatiable domestic demand for their products.

Export sales were a plus factor in the profit picture, but there was no need to go all out to make them. And any talk of a serious threat from imported goods seemed like a false echo of the 1930's.

A lot has happened since the first Berlin crisis twelve years ago.

W. Europe Recovers—The dollar gap has been closed. European industry, thanks in part to American aid, has grown robust and efficient. The nations of Western Europe have become strong partners in the free-world alliance and strong competitors of the United States in domestic and world markets.

More recently the formation of the European Common Market (and the European Free Trade Association) has focused American attention on the prospects for continuing rapid growth of Western Europe, both as a partner and as a competitor.

In the Common Market the American businessman sees something familiar — a group of independent states determined to remove the obstacles to trade between them and form a mass market, allowing mass production and greater efficiency.

American Pattern—If he looks a bit harder, he sees that these European states are planning to integrate their economies and coordinate

Common Market's Growth Rate

their political systems in somewhat the same way the thirteen American states first joined themselves together.

He then may ask the question: What does this move toward unity in Europe mean to the U. S.? Indeed this question is uppermost in the minds of many of the American businessmen one meets throughout the country and the world.

To answer that question fairly it is necessary to consider both its political and its commercial aspects.

Buying Power—The six Common Market countries now have a total population close to 170 million. In terms of real purchasing power, France, Germany, Italy and the Benelux nations offer a market roughly two-fifths the size of the United States.

By 1975 this purchasing power should be almost as great as that of the United States is now. Recently, the gross national product of the Common Market has been growing at almost twice the rate of this country. In international trade, total imports and exports for the six Common Market countries ran well over $49 billion last year.

This May the six countries expressed their confidence in the Common Market by speeding up the timetable for removing the barriers between them.

Strong Bloc—All this adds up to the fact that the European Common Market is expanding and will represent a strong bloc in international trade. For American business, this means both a challenge and an opportunity.

On one hand, the Common Market will cause European incomes and living standards to rise, and countries with more to spend tend to buy more—from abroad as well as at home. On the other hand, the Common Market will make European industry a tougher competitor in world markets.

For the most part European countries are exporters of manufactured goods and importers of raw materials. In fact, they are the largest importers of raw materials in the world.

More Competition — More than two-thirds of U. S. exports are raw materials and agricultural products, such as ores, basic chemicals, coal, grains, cotton, and tobacco. Most of these materials will continue to enter the Common Market countries as before.

Most American exporters of manufactured goods will face increasing competition, however. While internal tariffs in the Common Market are being cut to zero, American manufactures will face a common tariff wall.

Not all of our manufacturing exports will be affected by the common tariff. Aircraft, for example, will face a tariff of 12-15 pct; but trade in aircraft is determined by quality and design rather than by tariffs. The same holds true for many items of specialized machinery, in the manufacture of which America holds a technological edge.

Research Pays Off — But many American manufacturers will find it harder to sell in Europe. To begin with, European manufacturers will have a tariff advantage. Still more important, the emergence of a large American-style home market in Europe will justify mass production and marketing methods formerly unknown there and thus reduce European manufacturing costs. These lower costs mean stiffer competition not only in European markets, but in other countries as well.

American manufacturers still hold some high cards, however. These are their knowledge of mass marketing techniques, their management ability, and the tremendous sums of money they have poured into applied research and development in recent years.

Europeans will not learn overnight what it is to sell mass markets. Nor will they soon gain the talent to manage high-production enterprises with maximum efficiency.

A Balanced Look At the Common Market

David Rockefeller has wide experience in international banking and business problems.

As Vice Chairman of the Board of Directors, his many duties include that of planning The Chase Manhattan Bank's overseas activities. His acquaintanceship with top business and government leaders at home and abroad, give him a well-balanced view of the problems and possibilities of the European Common Market.

The youngest son of John D. Rockefeller, Jr., Mr. Rockefeller holds a B.S. degree from Harvard and a Ph.D. in economics from the University of Chicago.

Mr. Rockefeller at Chase's Paris office. ►

And the U. S. technological lead will continue to produce export sales despite increased competition in some lines of production.

Capital Goes Abroad — Meanwhile, the new opportunities opened up by the Common Market will cause more American capital to move to Western Europe. U. S. private investment already is well over $4 billion. This is more than 2½ times greater than in 1950.

During the last ten years the most attractive areas for American investments overseas have been Latin America and Canada. In the next ten years Europe, particularly the Common Market countries, will be favored. In twenty years, America's need for raw materials will result in substantial investments in Asia and Africa.

Needless to say, the Common Market offers U. S. business strong incentives for locating in Western Europe.

Lower Risks—The growth potential is high, particularly for consumer goods markets which Americans know better than anyone else in the world. The political and financial risks are probably lower than anywhere else outside the United States.

And there are the further incentives of low wage scales, flexible tax rates and long-established trade connections with the rest of the world.

The Common Market takes these ingredients and adds the big plus of an eventual mass market which until now has existed only in the U. S.

Over-all then, U. S. business has much to gain from the European Common Market. American companies operating on the continent stand to gain the most. Already over 300 American companies have started operations or set up new facilities in Western Europe since the formation of the Common Market in 1958.

Trade Policy—But at the same time our trade with Europe should also expand. I say **should** expand, because there is an "if" involved—and that is trade policy.

Neither the industrial countries of Western Europe nor the United States can afford the luxury of a high tariff wall. The growth and future prosperity of this country are, to a great extent, tied to the growth and future prosperity of the rest of the world. Already the employment of 4 million Americans depends on U. S. exports. And the European countries are still more dependent on world trade.

One means of aiding this growth on both sides of the Atlantic would be a further reduction in tariffs during the 1960-61 negotiations of the General Agreement on Tariffs and Trade.

This is by no means the entire answer. But Europe's markets are growing so rapidly that there should be no great disruption of present currents of trade—providing that a high tariff is not established by the European Economic Community.

Starting Point—A good part of the reason the Common Market's recent move to accelerate its timetable is looked upon with favor by many people is that it carries with it an offer to reduce the Common Market's tariffs by 20 pct in return for reciprocal concessions.

From the viewpoint of the United States this is not only a step in the right direction. It is the starting point for any worthwhile negotiation within the framework of the GATT meeting.

It is essential that the United States continue to lend its long-term support to the European Common Market, as long as it lowers its tariff against imports from outside and as long as it remains an "open club," ready to admit any newcomer who will accept the political and economic policies of the Common Market Treaty.

Answer Challenge — The right answer to the Common Market's challenge, then, is to keep our costs competitive through the latest production equipment; maintain our supremacy in mass marketing and production techniques; and to bargain for reductions in the trade barriers between the Common Market, ourselves, and the other countries of the free world.

By so doing, we take on the European countries not as cutthroat competitors but as partners in trade with the prospect of great mutual benefits.

Bold Move—This to me is the real significance of the European Common Market. It is more than supplying European consumers with more cars, appliances and household goods. It is a bold move to unite Western Europe and make it a powerful partner of the United States in the fight for freedom.

Two times within this century we have paid a high price for not having unity in Western Europe, for not having the likeness of a European Common Market.

It is encouraging to know that instead of a weak, divided and dependent ally on the Continent there is developing a strong, united, and independent partner in the Western Alliance—one which is capable of sharing with us the critical problems and challenges of our age.

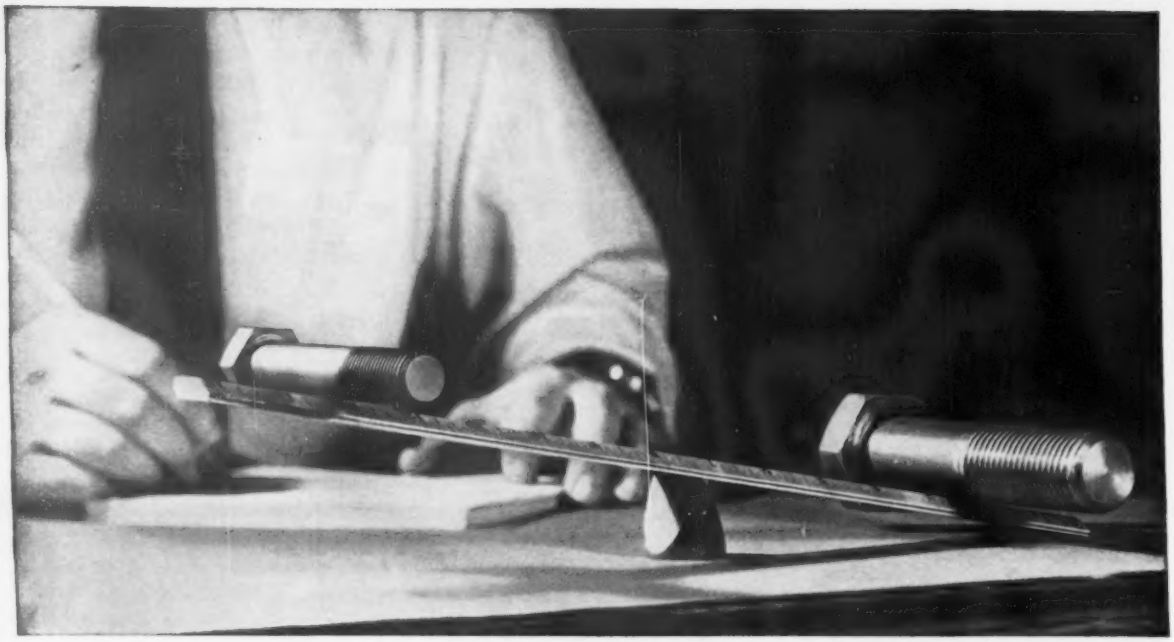
Reprints of this article are available as long as the supply lasts. Write Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

NEXT WEEK

New U. S. Plants In Western Europe

American companies have invested heavily in Common Market Area plants since its formation.

Next week's report, based on a Chase Manhattan Bank survey, will show the number and types of metalworking plants set up by American companies in W. Europe.



Weighs a 64% cost reduction

Fastener survey by RB&W seeks to deliver maximum holding power per fastener-dollar ... makes possible substantial savings

Since the job of a standard fastener is mainly to hold an assembly together, its *"clamping force"* is what you really want. You can reduce costs by applying this fact and buying fasteners by their *holding power* rather than size.

For example, compare SAE "proof load" and cost ratios of four different hex screws of standard steels.

Grade	SAE Grade 5	SAE Grade 7	SAE Grade 2	SAE Grade 2
Size	¾ x 5"	1 x 5"	1⅛ x 5"	1¼ x 5"
Proof load (lbs.)	28,400	16,950	21,350	27,100
Cost Ratio	100%	188%	239%	277%

Almost unbelievable. The smallest—the heat treated RB&W High Strength Hex Screw—exceeds all the others in load capacity, can usually be used instead of any of them. But, since it's smallest and weighs less, it also costs you less. 64% less than the 1¼" Grade 2 screw; 58% less than the 1⅛", etc. And because holes can be made smaller, you save on production, too.

Want to get the most from *your* fastener dollars? Let a specialist who best knows the subject of fasteners contribute his knowledge to that of your engineers. Contact Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N. Y.

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116th year

Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. Additional sales offices at: Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. Sales agents at: Cleveland, Milwaukee; New Orleans; Denver, Fargo. Distributors from coast to coast.

Why Ford Wants Basic Research

It May Lead to New Developments in All Fields

Ford's Scientific Lab departs from traditional research and delves into basic studies.

The reason: They might find the key to new ideas and developments for the future.—By A. E. Fleming.

■ "It's very provincial to restrict research to your own interest of application."

This comment by Dr. J. E. Goldman of Ford Motor Co.'s Scientific Laboratory, gives a clue to thinking behind the lab. The auto industry is noted for taking the practical approach when spending a dollar on research. Ford's Scientific Lab is unique: It's devoted to basic research.

Ford's Giant Step — Ford has taken a giant step to strengthen the future of its pure research activities. The move may be just as unique in industry as the lab itself is in the automotive field. The company has "guaranteed" the lab's budget for the next five years.

The company won't say how large a budget has been approved, but admits it's a "significant eight-digit figure."

Usually, budgets in the automotive industry show a remarkable sensitivity to ups and downs in auto sales. A good year brings fat budgets. A poor year results in narrow-scraping slashes. Advance engineering and research is generally cut deeply—the urgency can be postponed. Basic research—something definitely non-product oriented—is often virtually forgotten.

Brain Trust — But comments Henry Ford II, president and chairman of the board, "This budget will assure continuity of the Laboratory's operations without regard for business fluctuations. Our scientific staff and facilities are, we believe, the finest in the industry, but we are seeking even greater improvements."

And what does that mean? Between now and mid-1961 lab personnel will be increased by more than 50 pct. There are now about 175 scientists and technicians at work in the lab. About 50 of them have Ph. D.'s, another 80 have M.S. and B.S. degrees. By next summer the company would like to have nearly 100 Ph.D.'s working in the Laboratory. In 1954, only 10 to 15 professional people were engaged in basic research at Ford.

Scientific Freedom — Dr. Goldman, manager of the physics department, fills in for Dr. Michael Ference, Jr., executive director of the Laboratory, during his absences. He points out that the scientists cover a number of fields—physics, metallurgy, electronics, and all phases of chemistry.

"You have to have breadth in the fields of science," he explains. "You never know where you'll find the key to tomorrow's ideas and developments."

Ford's scientists can poke around

THE RESEARCHERS: Among the scinetists at Ford's Scientific Laboratory are these theoretical physicists, left to right, Drs. Hiroshi Sato, Anthony Arrott, Albert Overhauser, and J. E. Goldman, manager of the physics laboratory. Ford is attracting more and more scientists to its lab each year with the promise that they will see projects completed.

in any research areas they desire. Expansion of the staff won't change this policy. "They will be given whatever they need to do their jobs," Mr. Ford assures. "Above all, they will be given freedom to pursue pure research without specific product orientation."

Publication Counts—But work to date hasn't been without its product rewards. It has led to the development of ultra-high strength steels and ceramic metals. Other developments will probably be announced later this year or early next year.

And basic findings should be put to some use. Dr. Goldman says part of the expansion will center on setting up a staff of applications researchers. But, he insists, "Our final work is publication (of findings)—not patents. The patents will come of themselves."

Only three papers were published in 1954, one dealt with "Deboronization of Steel." Last year Ford scientists had nearly 50 scientific papers published — and the titles had become as exotic as "Cyclotron Absorption in Metallic Bismuth and its Alloys." The increase in staff is expected to bring more papers.

Dearborn Campus—The Laboratory itself is in a campus-like setting, a part of the company's Engineering and Research Center in Dearborn. "We're trying to create a scientific atmosphere for the scientists," explains Dr. Goldman. "And we believe we're approaching the Utopia we set out to create."

For one thing, there is a free exchange of ideas between Laboratory scientists and those at other companies and in other nations. "Basic research knows no boundaries of companies—or nations. It thrives only with the free exchange of ideas," the physicist says.

International Prestige—In addition, the Laboratory runs an average of two seminars a week where leading scientists from universities and industry are presented. In turn, Ford sends out its scientists to any significant institution that invites them—and this includes scientific groups in foreign countries.

This approach has brought international recognition and prestige to the Laboratory in the span of only a few years. It has also brought stability. There have been no departures of top people.

And with the added frosting of a guaranteed budget, top scientists are now seeking out Ford. "Since the announcement of the 5-year plan it is becoming almost ridiculously easy to attract scientific leaders," Dr. Goldman says. "Technical stability is more important with scientists than personal security. They want to be able to see a project through—not worry if it'll be stopped midway."

New Alloy Will Give Cars Trim Appearance

MIRROR FINISH: Aluminum alloys produced by Aluminum Co. of America show brightness and reflectivity for decorative use on new cars. Alcoa "upgraded" the brightness by modification in the anodizing technique, a process imparting a sapphire-like hardness to the metal.

Dow Aims at More Magnesium in Cars

Magnesium producers have tried to crack the automotive market with volume applications without success. In resisting, automakers have always thrown up a barrage of engineering and technical arguments.

Dow Chemical Co. intends to beat them down. By November it will have a $400,000 laboratory in operation, designed to help solve production problems in magnesium.

Automakers have continually expressed interest in magnesium—it's one-third lighter than aluminum. And it could give a strong assist in the battle to hold down weight. But, because of technical problems, engineers have turned to aluminum and plastics.

Forge shops save money and increase production with these Salem-Brosius furnaces

Salem-Brosius furnaces are favorites in shops that forge stainless steels, titanium, zirconium, aluminum, and many of the refractory alloys used in jet engines and missiles, as well as the full range of carbon steels generally employed. The battery of batch furnaces above is now in continuous operation in the plant of one of the nation's outstanding forgers of newer alloys. The rotary hearth furnace below heats bar stock for closed-die automotive forgings.

Forge shop operators specify Salem-Brosius furnaces because they are built for long service life with common-sense structural, refractory, and mechanical characteristics. Designed for manual or automatic charge and discharge, rotaries such as this offer efficient, low-cost heating. They can be manually or automatically controlled, and offer assurance of fast and uniform output at high speed in a minimum of floor space.

Whether you require these or any other type of heating or heat-treating furnaces, Salem-Brosius can build them. Call us today.

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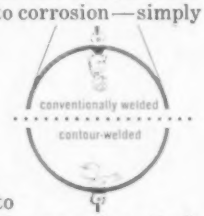
"The Gravity Kid" shows how

CONTOUR-WELDED STAINLESS TUBING DEFIES CORROSIVE ATTACKS

It's smoother inside than any other tubing—welded or seamless—because the patented* Contour-welding process virtually eliminates the weld bead. And this smoother surface ensures greater resistance to corrosion—simply because there are fewer focal points for corrosive attack.



You see, in conventionally welded tubing, gravity pulls the molten metal down into the tubing. This forms a bead that is difficult to remove by cold working. And cold working can lead to undercuts that become focal areas for corrosive attack.

Contour-welded tubing, however, is welded at the bottom. Gravity still pulls the molten metal down. But now the weld area corresponds to the contour of the tube. There's virtually no weld bulge on the inside surface. And even on the O.D., the weld seam closely conforms to the tubing contour.

Contour-welded tubing is smoother, too, than seamless. That's because it's formed from uniformly rolled strip steel whereas seamless is extruded from a billet.

But get full details on this corrosion-resistant tubing. Send for our free 48-page manual on Contour-welded tubing in sizes from 1/8" to 40" O.D.—in stainless and high alloy steels, titanium, zirconium, zircalloy and Hastelloy.**

U.S. Patent 2,716,692

**Trademark Haynes Stellite Co.

TRENTWELD® Stainless and High Alloy Tubing

Trent Tube Company, a Subsidiary of Crucible Steel Company of America. General Offices and Mills: East Troy, Wisc.; Fullerton, Calif.

Taxes to Go Up, Regardless . . .

Both Parties Boast Tax Reforms

Higher taxes seem inevitable. The big question is: From whose pocket will they come?

Democrats will attempt to close tax loopholes. Republicans hope to help top brackets. —By R. W. Crosby.

■ Democrats or Republicans in November, tax reform is a sure thing.

Both parties now call for tax changes to stimulate economic growth. In its simple form, this means tax cuts for the general public. President Eisenhower's recent announcement that the government had a $1.1 billion budget surplus for the year ending June 30 seems to add fuel to the tax cutting fire.

But don't let campaign platforms fool you.

A bitter election battle will result in sharp increases in government spending. To fulfill campaign promises, revenue-raising tax increases are more likely than tax cuts.

Tax Cuts?—The Republicans, no doubt, will try to liberalize depreciation rules on business equipment. They hope, too, to reduce individual taxes in the top brackets.

But Republicans are promising better defense and more foreign aid. Both cost money. Money is most likely to come from higher taxes.

Democrats say the man in the lower bracket should get any tax cut benefits. But they are more interested in closing so-called "tax loopholes."

Closing loopholes will mean a tightening of businessmen's expense account write-offs, a tax on dividends and interest, collecting billions of tax dollars owed but not collected, and others.

In the Kitty—Major tax relief could definitely be tied to a surplus. But how much money finally ends up the Federal kitty depends a great deal on what Congress does next month.

It is the unbudgeted spending bills which will cause the trouble.

Medical care for the aged, aid to education, urban renewal, housing aid, and other such unbudgeted spending programs could cut a huge chunk out of the treasury.

New Machinery Directory Available

A two-volume revision of the Defense Department's Directory of Metalworking Machinery has been completed.

The 1960 edition carries about 80,000 machine tool items. It is a complete revamp of the 1956 directory and replaces any others in existence.

The book lists by manufacturer's name, English description, general size and Production Equipment Code (PEC) number.

The price is $7.50. It should be ordered by Catalog No. D-101.-22:7-½. Copies of 100 or more delivered to one address get a 25 pct discount.

Steam in Washington Kettle

Minimum Wage Battle — The Democratic ticket of Kennedy-Johnson may mean a tough minimum wage bill in the August session of Congress. Senate Democrats will push for a bill to raise the $1 hourly minimum to $1.25 and extend coverage to 3.5 million workers. Kennedy wrote the bill. The House has already rejected this measure for a $1.15 minimum with the addition of 1.4 million retail workers. The new coalition power of Kennedy-Johnson may make the difference. But an Ike veto awaits $1.25 bill.

Dept. of Consumers?—The creation of a U. S. Dept. of Consumers will be pushed in Congress next year. Efforts in this session won little support. But the issue is still very much alive. Labor finds it much to its liking. Biggest backer of Consumer Department is Sen. Estes Kefauver, D., Tenn. The agency would have the power to review and investigate any price changes by manufacturers, wholesalers and retailers. It would also have power to evaluate product suitability and quality.

Air, Water Pollution—Industry will feel new pressures from Washington to stop air and water pollution caused by industrial waste. Congress will continue to pass more and broader pollution legislation.

Tariff Negotiations—The U. S. will adopt a get tough policy at the international tariff negotiations in Geneva this September. The Administration says there will be no further lowering of duties where foreign competition is already hurting domestic industries. The Administration realizes, however, that if you want to sell you have to buy. The policy may not end up to be as tough as some would like it.

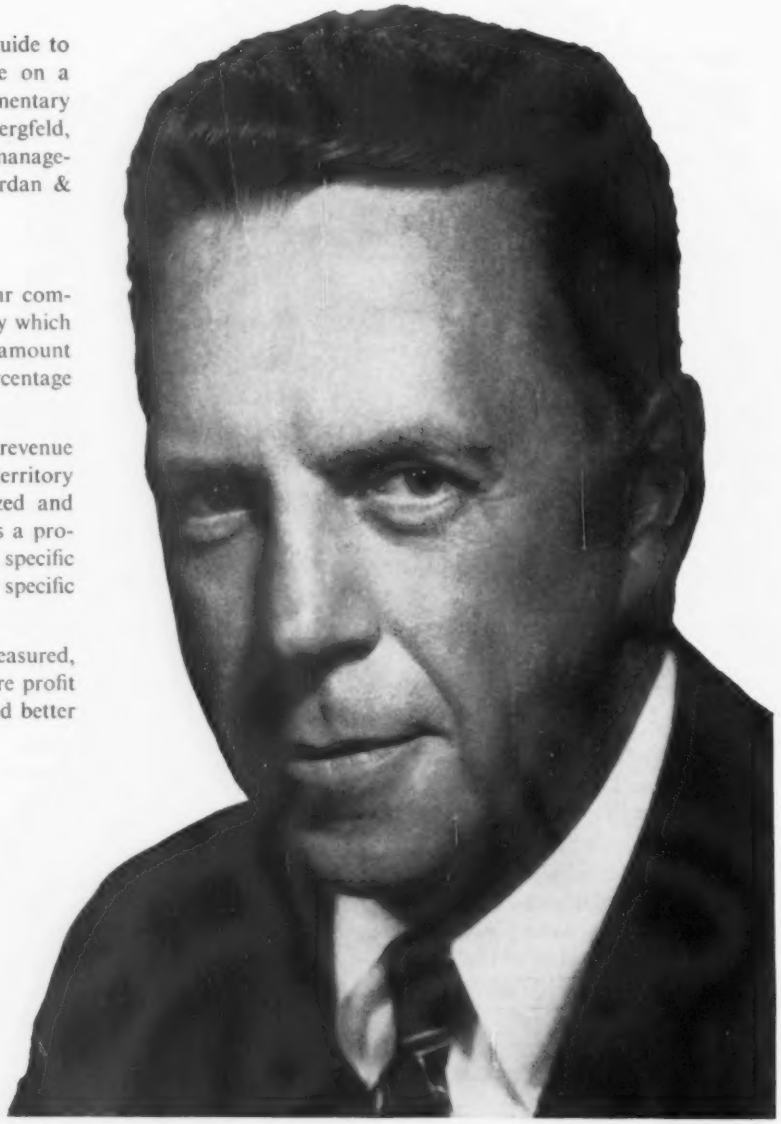
"What's so bad about basing the ad budget on last year's shipments?"

Management men, seeking a reliable guide to advertising appropriations, often settle on a percentage of sales. The following commentary on this practice was written by A. J. Bergfeld, President of the internationally known management consultant firm of Stevenson, Jordan & Harrison, Inc.

"Past practices of your own or of your competitors will produce no magic ratios by which you can either judge or budget the right amount of advertising automatically as a percentage of past sales.

"Plans for increasing sales volume, sales revenue and resulting profits by product and by territory or by divisions, can better be analyzed and approved by considering advertising as a programmed cost to be associated with specific profit plans and to be measured against specific results.

"Programming advertising costs as a measured, reasoned and integrated part of a future profit plan usually results in a better plan and better actual future profits."



AIA

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An organization of over 4000 members engaged in the advertising and marketing of industrial products, with local chapters in ALBANY, BALTIMORE, BOSTON, BUFFALO, CHICAGO, CLEVELAND, COLUMBUS, DALLAS, DENVER, DETROIT, HAMILTON, ONT., HARTFORD, HOUSTON, INDIANAPOLIS, LOS ANGELES, MILWAUKEE, MINNEAPOLIS, MONTREAL, QUE., NEWARK, NEW YORK, PHILADELPHIA, PHOENIX, PITTSBURGH, PORTLAND, ROCHESTER, ST. LOUIS, SAN FRANCISCO, TORONTO, ONT., TULSA, YOUNGSTOWN.

How Oil Boosts Coast Economy

It Opens Big Metalworking Markets

A booming petroleum industry on the West Coast means extra markets for metalworking.

California is main hub of oil activity. More than 1 million barrels a day are being pumped. —By R. R. Kay.

■ Oil means millions in metalworking sales. The petroleum industry on the West Coast is huge. And with more and more people, cars and industry coming, the oil business will keep moving ahead.

Value of the industry's plant and equipment runs to $7 billion. This includes the three West Coast states of California, Oregon and Washington, plus Arizona and Nevada. California alone accounts for $6.3 billion. Next is Washington with some $400 million.

Metalworking products show up big. The area is laced with 7000 miles of pipelines for crude oil and refined products. And there are huge fleets of tank trucks, tank cars, and marine tankers. Storage facilities, gas stations, and wholesale marketing outlets also use big amounts of metalworking products.

A California Industry — Today, over 37,000 wells produce some 340 million barrels of crude oil per year. Forty-three refineries have a daily total capacity of 1.3 million barrels of crude oil.

The petroleum industry is pretty much concentrated in California. The state produces, refines, markets, and transports. California's 131,000 oil industry employees earn about $736 million per year, while salaries and wages for the five states run to $895 million per year.

West Coast oil companies pay whopping taxes—over $800 million annually in Federal, state, and local tabs. In fact, they're one of the largest industrial taxpayers, according to Western Oil and Gas Assn.

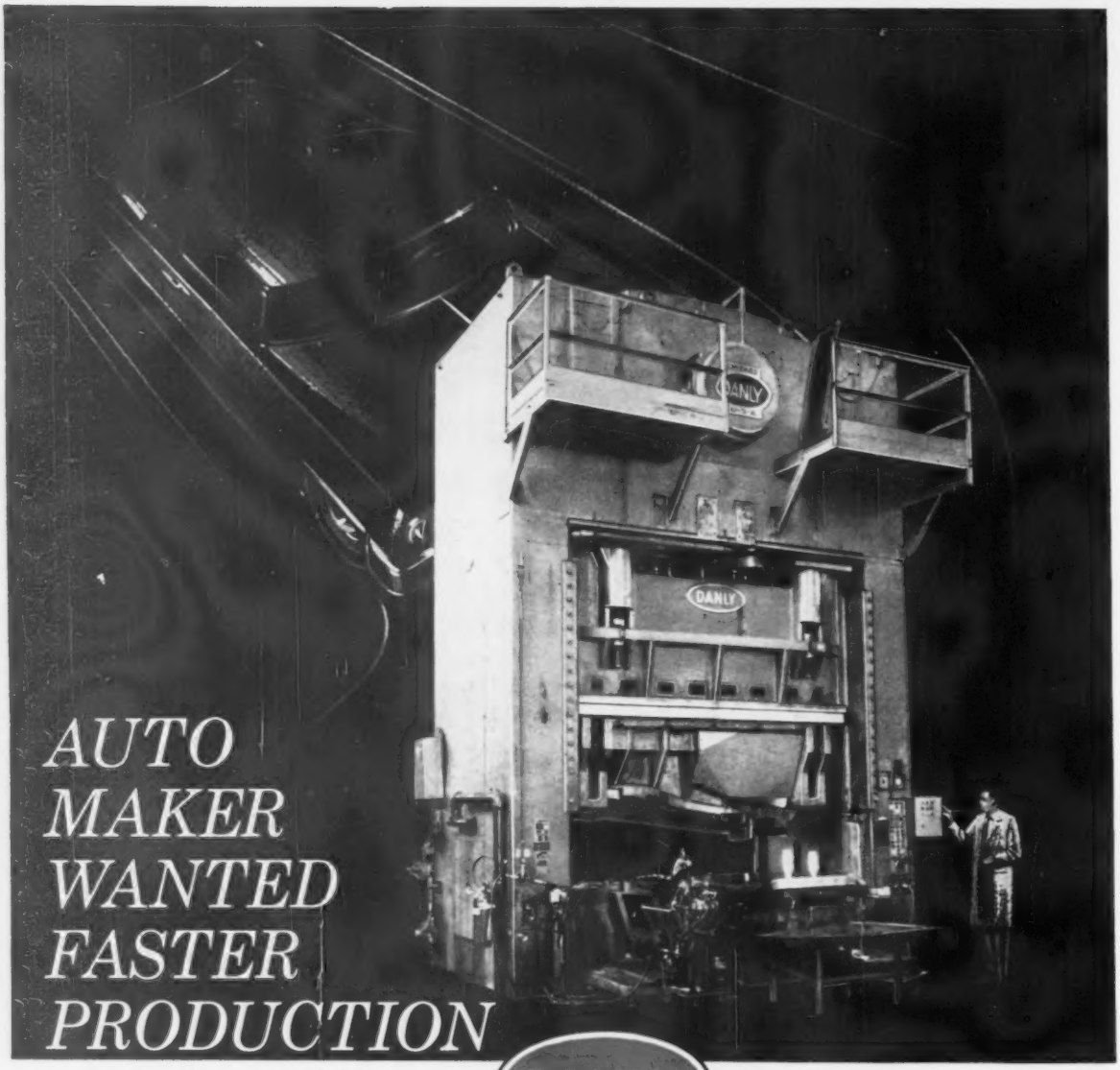
Daystrom Expands West

Wiancko Engineering Co., Pasadena, will be merged with Daystrom, Inc. The move will enlarge the latter's manufacturing line of electrical and electronics products.

Wiancko, founded in 1946, is a leading producer of instrument systems and transducers for measurement control. Its sales average about $5 million annually. Daystrom sales last year were $90 million.

Aluminum Scissor Bridges for Army

THE NEWEST THING: Allison Steel Manufacturing Co., Phoenix, Ariz., has landed a $4 million defense contract calling for the use of some 2.5 million pounds of aluminum. The company will make 140 scissor-type aluminum bridges for the U. S. Corps of Engineers. The bridges will be hydraulically launched from a tank mounting. It is so planned, that a tank driver can put the bridge in place without exposing himself. The aluminum bridge capacity rating is 60 tons.



AUTO MAKER WANTED FASTER PRODUCTION

. . . and got it from DANLY®

Deep draw body parts were the bottleneck when presses for the job couldn't deliver more than 7 fender draws per minute. So Danly supplied a double-action press equipped with a DANLY 2-SPEED CLUTCH that automatically speeds up approach and return of the slides, but keeps draw speed safe and slow. The rate was raised to 10 draws per minute without speeding up the critical drawing action. Output jumped from 420 to 600 parts per hour . . . a healthy 43% improvement.

And, typical of Danly equipment, both press and clutch have performed without a single interruption in output for maintenance. Another example of Danly ability to solve metal stamping problems with dependable, versatile equipment . . . this time with a low-inertia,2-SPEED CLUTCH that makes a top-notch press even better!

Danly manufactures a complete line of mechanical presses, in capacities from 25 tons to 4,000 tons . . . and up. Send for your copy of the Condensed Catalog of Danly Presses and ask for detailed information on The DANLY 2-SPEED CLUTCH . . . NOW.

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Export Bolsters Tool Orders

But Some Builders Have Reservations on Export

A big surge in foreign orders is responsible for a rise in new business for cutting tools.

A low rate of tool ordering by automotive companies is a sore point.—By R. H. Eshelman.

■ Although latest machine tool orders show a modest rise, there is little cause for rejoicing among the builders.

June orders for cutting tools show a modest rise to $43.2 million. But forming tools are only holding their own at $11.8 million.

But the big news, again, lies in the distribution. Some $17.8 million of the new cutting tool orders are from foreign sources. But only $1.95 million of the press orders are from overseas. However, forming tool orders have fluctuated rather widely for many months. A good month of foreign orders has been followed by an easing of orders in the following month.

Some Reservations—These figures should be heartening to the industry, now in the traditionally slow summer months. But there's a feeling that the sales abroad are a rather uncertain business, and nothing to build a bank on. Besides, while some builders, especially those in the field of special machines, report business is good, others are finding it slow.

Summing up this feeling is H. R. Conner, executive vice president of Detroit Broach & Machine Co. "The machine tool business has not measured up to expectations, this year," he explains.

Low Automotive Business—For one thing, he notes, there has been a noticeable lack of extensive changeovers that have characterized the automotive business in the past. Many firms seem to be using existing equipment, converting rather than buying. And again in '61 rebuilding and retooling seems to be the rule.

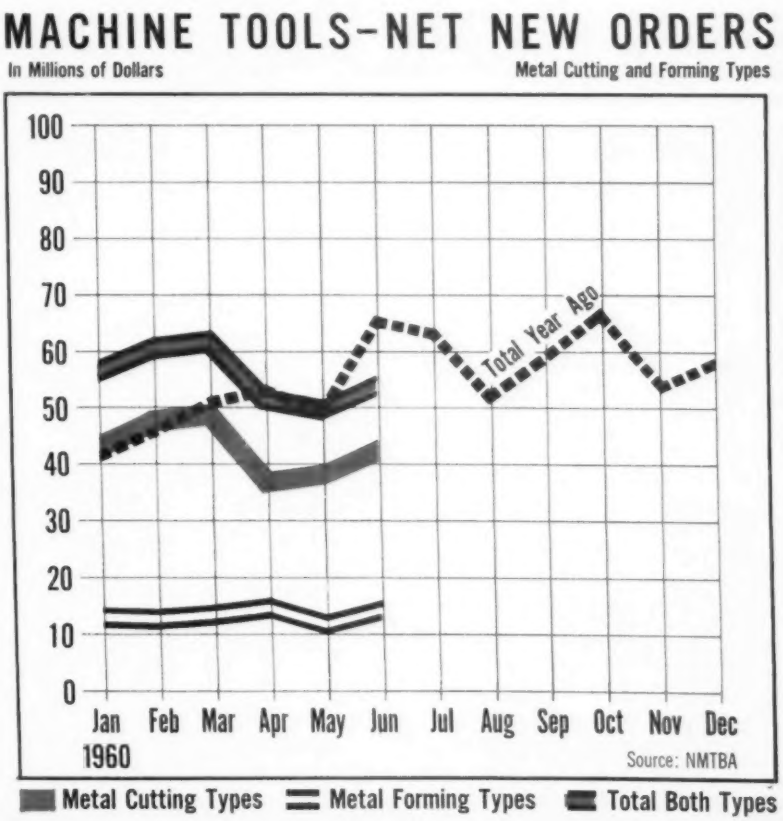
Even the booming compacts have failed to create much of a tool buying splurge. So the foreign business comes at a very welcome time.

European Factors—The European market is booming. True, there's not much to be realized here in general lines. But many builders of specials are benefiting. Prospects are that this business may even improve in the months ahead, Mr. Conner observes.

His opinion is bolstered by more than a crystal ball, however. Sales vice president, E. H. H. Graf, along with many builder executives, is now touring Europe.

Russians, Too—Even the Russians are getting into the act. Approval of an export license for a Cross transfer machine has stirred a flurry of interest. But don't look for any sudden flood of orders from Iron Curtain countries.

Rules laid down by the Dept. of Commerce are strict indeed. Each request gets individual top level committee treatment, a spokesman for the department explains. The committee must be satisfied that the tools are not of strategic defense value, nor can be readily converted to such use.



INDUSTRIAL BRIEFS

Inauguration Day — Elmer W. Cress, president of the Buchanan Steel Products Corp., Buchanan, Mich., was recently elected president of the Drop Forging Association. Other officers elected were William A. Carlile, Jr., executive vice president of Columbus Bolt & Forging Co., Columbus, O.; and Walter H. Stocking, executive vice president of Pittsburgh Forgings Co., Pittsburgh.

A New Addition — Coast Pro-Seal & Mfg. Co., Los Angeles, has acquired Fabrodynamics, Inc., Gardena, Calif. The new addition will engage principally in the fabrication of electronic enclosures. It will be known as Aero-Cal Metal Fabricators, Inc., a wholly-owned subsidiary of Coast Pro-Seal & Mfg. Co.

Contest Still On—The Brass & Bronze Ingot Institute has extended the date line in its Progress '60 Brass & Bronze Casting Competition to September 30. The competition for the best new or projected uses for brass or bronze castings offers $1000 in cash awards. For information, contact the Brass & Bronze Casting Institute, 308 Washington St., W., Chicago 6, Ill.

Modern Prospectors—The Susquehanna Corp., Chicago, has entered into option agreements with Raindor Gold Mines, Ltd., Toronto, to conduct explorations of Raindor's Canadian mining properties. It consists of deposits of gold, silver, lead, zinc, and minor amounts of copper and cadmium, and are located near Revelstoke, British Columbia.

Forming a Subsidiary — Rheem Manufacturing Co. and an Italian associate have agreed to form a subsidiary company to make up to 100,000 tons of medium-diameter welded steel tubes in a new plant at Palermo, Sicily. It will be the 33rd plant making Rheem products in 16 nations abroad. Production is scheduled to start in March 1961.

Machine Purchased — A scarfing machine for the removal of surface defects from carbon steel has been purchased from Union Carbide International Co. in New York by Phoenix-Rheinrohr A. G. of Dusseldorf, West Germany. It is installed in the West German company's Ruhrort plant. The company recently purchased about 2.5 million worth of machinery and equipment in the U. S.

For Heavy Loaders — R. B. McCready has organized a design and consulting engineering firm known as Kerma Corp. Its main interest will be in the field of heavy and special materials handling equipment. The company will be located at 1511 E. State St., Alliance, O.

Reliance Purchased — Reliance Instrument Mfg. Corp., Glen Cove, N. Y., has been purchased by Electro - Mech Corp., Norwood, N. J., subsidiary of American Chain & Cable Co., Inc. The Glen Cove company will operate as the Reliance Instrument Div. of Electro-Mech Corp.

Houston Warehouse—The Crucible Steel Company of America has opened a branch warehouse in Houston, Tex. Previously, Crucible steels were distributed in this area by Steel and Machine Tool Sales, Inc., a pioneer distributor of steel and industrial equipment.

"Hello, Martha . . . Is a peanut butter and jelly sandwich your idea of a businessman's lunch?"

Casting Buys Jelrus—Jelrus Precision Casting Corp. of New York has been purchased by Casting Engineers of Chicago. According to the announcement of the transaction, Jelrus will continue to operate under its own name. John McCormick, chief engineer at Casting Engineers, has been appointed general manager of the new facility, and will direct all manufacturing operations. Casting Engineers is itself a division of Consolidated Foundries & Mfg. Co. of Chicago.

Canadian Subsidiary — Foote Bros. Gear & Machine Corp., Chicago, and The David Brown Corp., Ltd., London, have formed a jointly-owned sales subsidiary in Canada. It will be known as David-Brown—Foote Gears, Ltd. The new company will take over sales and distribution in Canada of gear products manufactured by both companies, plus products of The Whitney Chain Co., div. of Foote Bros.

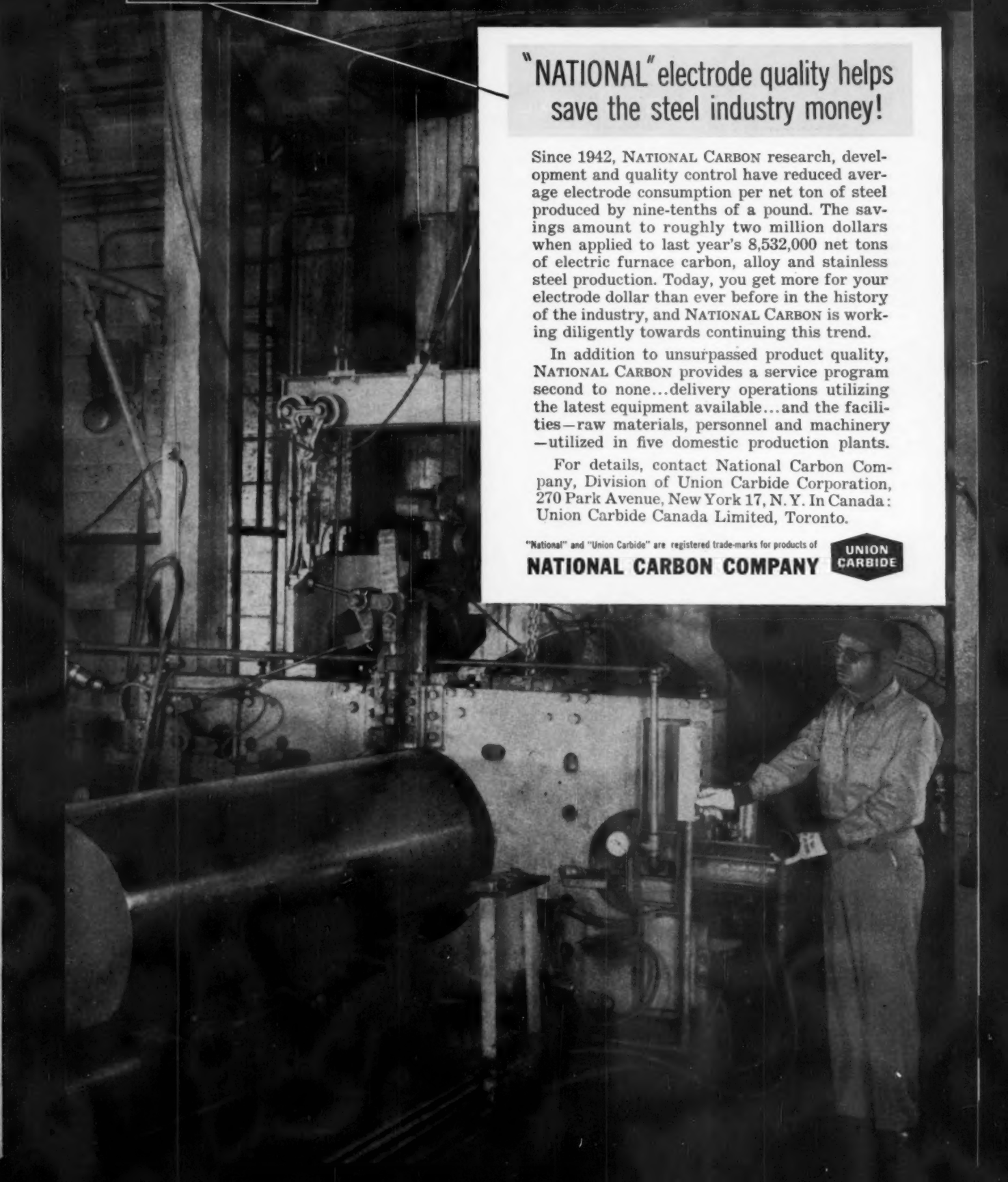
Ingot Distributor—The Charles Batchelder Co., Botsford, Conn., has been appointed an ingot distributor for Kaiser Aluminum & Chemical Sales, Inc. Officers of the concern are Charles Batchelder, president; John Dougherty, vice president; and Donald J. Edmunds, treasurer.

Into Space — Ground has been broken for the new $750,000 Space Instrumentation Center of Vector Manufacturing Co., Inc., manufacturers of electronic components and systems, used in connection with the development of rockets, missiles and airborne and space vehicles. The new center is located in Trevose, Pa.

Special Events — The Twin Coach Co., producer of aircraft, missile and vehicle parts, has announced the formation of a new special products division. The new division will be located in Waverly, N. Y., where the company has just leased a 48,000 sq. ft. plant formerly used by the Corning Glass Works. The plant is located on an 18 acre site suitable for expansion.

MAJOR REASONS FOR SPECIFYING NATIONAL ELECTRODES...

QUALITY SERVICE · DELIVERY · FACILITIES!



"NATIONAL" electrode quality helps save the steel industry money!

Since 1942, NATIONAL CARBON research, development and quality control have reduced average electrode consumption per net ton of steel produced by nine-tenths of a pound. The savings amount to roughly two million dollars when applied to last year's 8,532,000 net tons of electric furnace carbon, alloy and stainless steel production. Today, you get more for your electrode dollar than ever before in the history of the industry, and NATIONAL CARBON is working diligently towards continuing this trend.

In addition to unsurpassed product quality, NATIONAL CARBON provides a service program second to none...delivery operations utilizing the latest equipment available...and the facilities—raw materials, personnel and machinery—utilized in five domestic production plants.

For details, contact National Carbon Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N. Y. In Canada: Union Carbide Canada Limited, Toronto.

"National" and "Union Carbide" are registered trade-marks for products of

NATIONAL CARBON COMPANY

UNION CARBIDE

Ohio Rolls

SHAPING METAL FOR ALL INDUSTRY

Ohio Iron and Steel Rolls

- FORGED AND HARDENED STEEL ROLLS
- Carbon Steel Rolls
- Ohioloy Rolls
- Ohioloy "K" Rolls
- Flintuff Rolls
- Double-Pour Rolls
- Chilled Iron Rolls
- Denso Iron Rolls
- Nickel Grain Rolls
- Special Iron Rolls
- Nioloy Rolls

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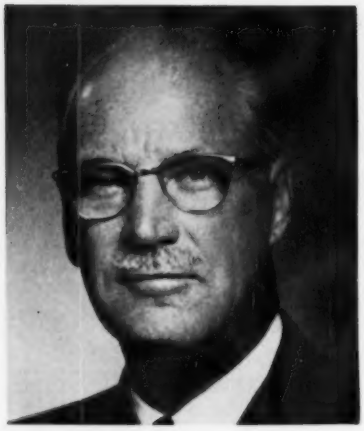
THE OHIO STEEL FOUNDRY CO., LIMA, OHIO

PLANTS AT LIMA AND SPRINGFIELD, OHIO... *Virtually at the center of the steel industry*



Gordon Patterson, elected president and a director, The Yale & Towne Manufacturing Co.

Rheem Manufacturing Co.—**M. R. Swain,** appointed vice president.

Keokuk Electro-Metals Co., Div. of Vanadium Corp. of America—**W. T. McGinnis,** appointed executive vice president.

Alemite and Instrument Div., Stewart-Warner Corp.—**Gus Treffeisen,** appointed manager, marketing.

Udylite Div., Udylite Corp.—**D. L. Buttrey,** appointed factory manager; **Robert Cassel,** appointed asst. factory manager.

The Youngstown Sheet & Tube Co.—**W. L. Scott, Jr.,** appointed superintendent, and **R. L. Crowe,** to asst. superintendent, No. 3 seamless tube mill, Indiana Harbor Works.

Colorado Fuel & Iron Corp.—**W. E. Burns,** appointed general foreman, coke plant, Pueblo (Colorado) plant; **J. R. Purdy,** appointed asst. superintendent, coke plant, Pueblo.

Armco Div., Armco Steel Corp.—**W. B. Browning, Jr.,** named asst. chief engineer; **C. G. Kramer,** named asst. works engineer, Butler, Pa., Works.

Crucible Steel Co. of America—**J. W. Duba,** appointed manager, Cincinnati sales branch.

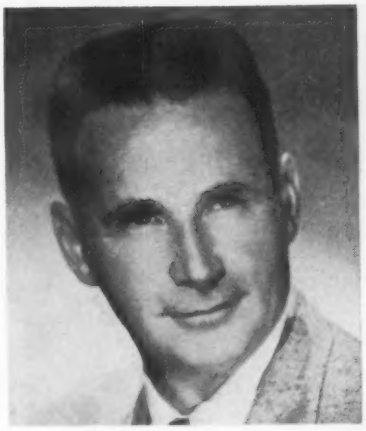
The Cleveland Cap Screw Co.—**John P. G. Patton,** elected secretary and a member of the board of directors. He succeeds T. A. Fribley, recently elected president.

Jones & Laughlin Steel Corp.—**H. S. Phillips,** appointed district sales manager, Baltimore, Md., sales office.

Peterson Steels (Canada) Ltd.—**G. M. Wood,** named general manager, Toronto, Canada.

Bay State Abrasive Products Co.—**A. B. Hughes,** appointed West Coast district manager.

Consolidated Systems Corp.—**B. C. Whitney,** appointed Western regional manager.



H. E. Stack, promoted to president, Stack Steel & Supply Co., Seattle, Wash. He succeeds Eugene Stack who has been named chairman of the board.

The Cooper-Bessemer Corp.—**W. F. Heavey,** appointed sales engineer, Washington office.

Pennsylvania Engineering Corp.—**R. P. Krause,** named chief engineer; **A. C. Kohnfelder,** appointed asst. to the vice president, engineering.

Allied Chemical's General Chemical Div.—**W. E. Houghton,** appointed sales manager, basic indus-

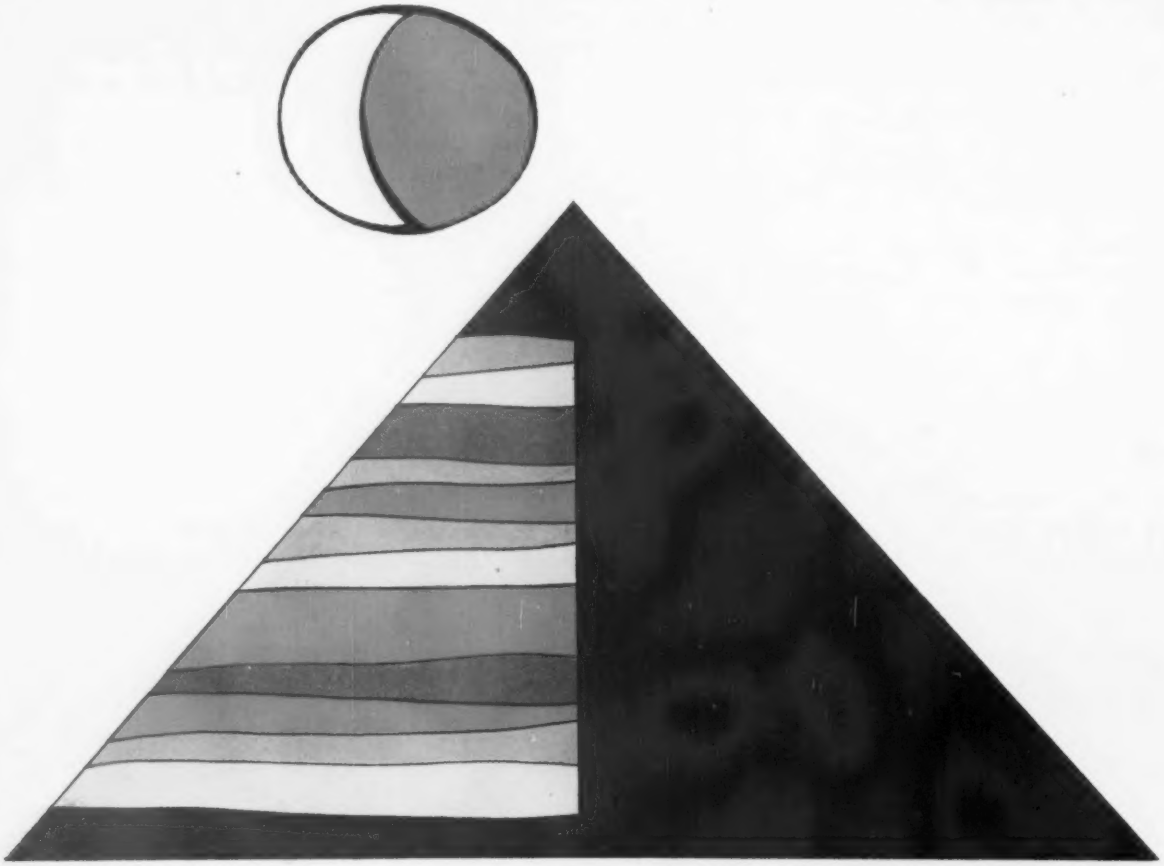
(Continued on P. 67)

C. F. Safreed, named chairman of the board, The Cleveland Crane & Engineering Co., Wickliffe, O.

H. T. Florence, elected president and general manager, The Cleveland Crane & Engineering Co.

S. W. May, named vice president and treasurer, Stack Steel & Supply Co., Seattle, Wash.

You'll put permanence into products with Western Brass because brass is tough to start with... because time, use and environmental attack only mellow it. But whether you use brass for strength or appeal, your product calls for an individual alloy, temper, gauge and finish. Count on Western Brass to recommend and produce exactly the right one. (It will even arrive in boxes specially adapted to your handling methods.) You'll make it better with durable brass. You'll make it best with "tailor-made" Western Brass.



OLIN MATHIESON • METALS DIVISION • EAST ALTON, ILL., NEW HAVEN, CONN.

Western BRASS

(Continued from P. 65)

trial chemicals; **J. W. Kelley,** appointed sales manager, basic industrial chemicals.

Pangborn Corp.—**A. J. Sartor,** named sales engineer, vibratory finishing, Detroit office.

V. R. Troglione, elected president, Sunbeam Equipment Corp. He succeeds H. C. Gwinn, who has been named chairman of the board.

Minneapolis-Honeywell Regulator Co.—**Dr. V. W. Bearinger,** appointed director, research; **Dr. J. N. Dempsey** and **E. E. Rexer,** named asst. research directors.

The Babcock & Wilcox Co., Refractories Div. — **R. P. Stuntz,** named manager, field sales, and **L. D. Christie, Jr.,** named product manager, technical sales.

Robert Henderson, appointed vice president, Western operations, Climax Molybdenum Co., Div. of American Metal Climax, Inc.

Lars Ekholm, appointed vice president, Eastern operations, Climax Molybdenum Co., Div. of American Metal Climax.

The Carpenter Steel Co.—**C. D. Steinwedel,** named manager, warehouse operations.

Despatch Oven Co.—**L. J. Lindstrom,** appointed manager, engineering and research.

Stanley Steel Strapping, Div. of The Stanley Works—**James H. W. Conklin,** appointed general sales manager.

C. F. Simmers, named chief engineer, Engineering and Construction Div., Koppers Co., Inc., Pittsburgh.

The R. K. LeBlond Machine Tool Co. — **R. L. Fuller,** named sales engineer, Philadelphia.

Consolidated Systems Corp.—**B. M. Bushman,** appointed director,

(Continued on P. 71)

it's dependability that counts !

Yes, *life* often rests on the dependability of the fastener.

Whether for bridges, pressure piping, skyscrapers, railroads, transformers or tunnels . . . or even your personal car, it's the *dependability of the fastener* that counts. The fastener must be *stronger . . . more dependable* than the part.

When you visit our manufacturing facilities and control laboratories, you will see for yourself how we build dependability into our IMPACT-FORM'D nuts, bolts and screws.

IMPACT-FORM'D Screw and Bolt fasteners are produced to customer demand every day:

- free–or interference-fit rail bolts
- high strength heat treated bolts for heavy construction
- close tolerance components for machinery
- screws for electronic equipment and accessories

Whether you follow industry standards or have your own specifications, IMPACT-FORM'D Screw and Bolt fasteners have the *dependability* you need.

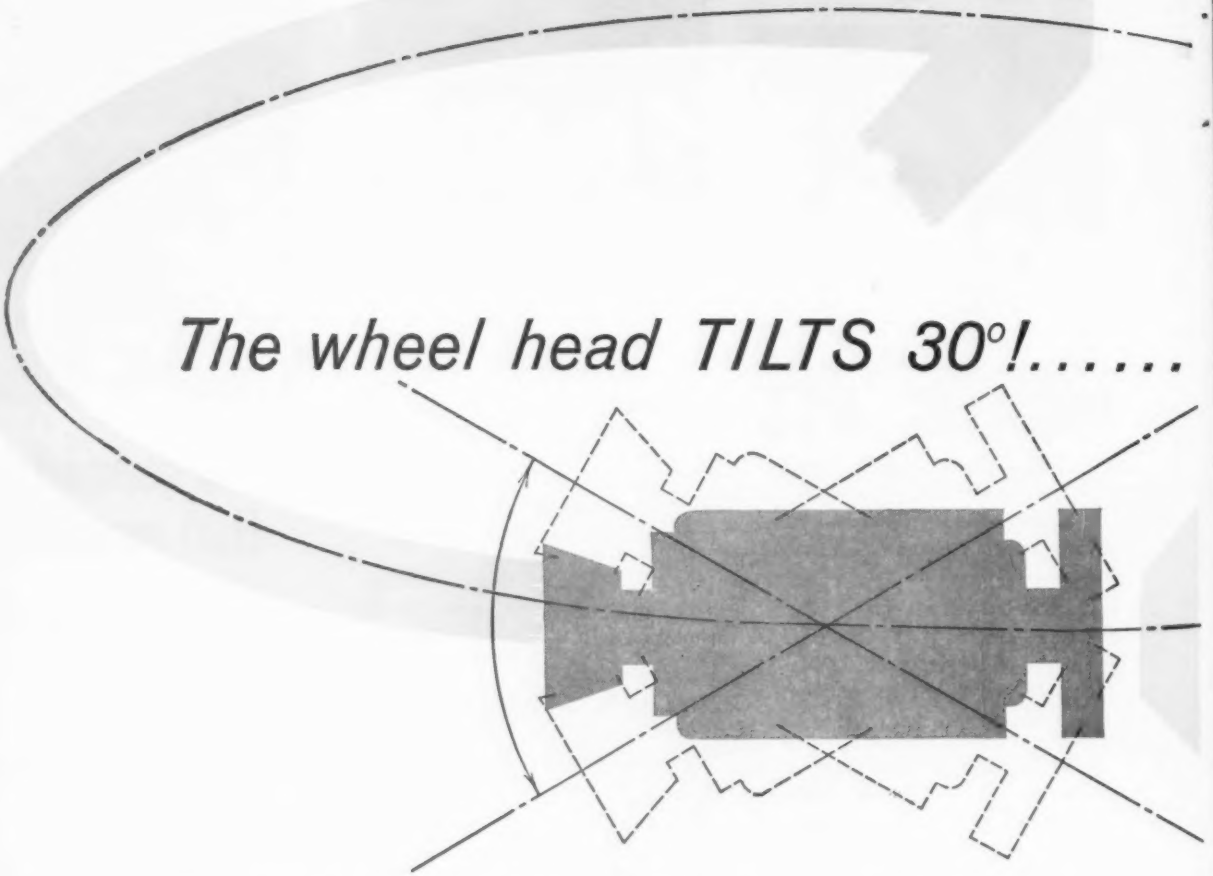
VMA 6007

SCREW AND BOLT CORPORATION OF AMERICA
P.O. Box 1708
Pittsburgh 30, Pa.

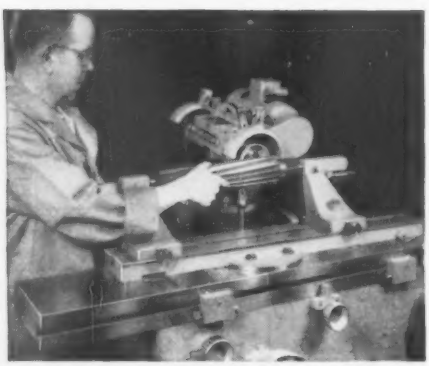
DIVISIONS: *Pittsburgh Gary · Southington Hardware American Equipment*

America's Most Complete Line of Industrial Fasteners

The wheel head TILTS 30°!.....



The NEW NORTON No. 200 Cutter and Tool Grinder makes setups simpler . . . easier . . . quicker!



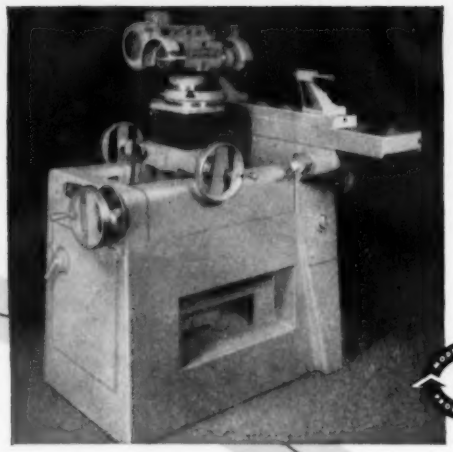
Tool room men can tell you that grinding a taper reamer is one of their toughest jobs. But now they're discovering that it and other tough tool grinding jobs are a "snap" with the new Norton No. 200. Because:

You can tilt the wheel head up to 15° above or below horizontal — and swivel it through a full orbit of 360°.

And the table has a very rugged, extremely accurate guide bar, which assures precision in tracking, during the most difficult grinding jobs.

All this means no more time-wasting "cut and try" tactics . . . no more wrestling with tricky setups . . . a wheel head scale provides quick direct readings of clearance angles . . . for practically all grinding on centers, the

NORTON PRODUCTS: Abrasives • Grinding Wheels • Machine Tools • Refractories • Electro-Chemicals — BEHR-MANNING DIVISION: Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes



ORBITS 360°!

VISIT BOOTH #651
Machine Tool Exposition • 1960
INTERNATIONAL AMPITHEATRE
Chicago — September 6-16

tooth rest can be kept on the center-line of the cutter, eliminating time losses from additional settings . . . the table design enables use of gage blocks for quick taper grinding setups and fast return of table to straight setting . . . greater wheel head capacity through eccentric mounting simplifies approach to many special jobs.

In addition:

The No. 200's extremely solid grinding action brings you excellent finish on tool cutting edges, with resulting benefits in tool life and performance. That's because the No. 200 is a wheel slide type machine, where grinding is always within the area of the rigid base, with no instability due to work overhang. Other advanced features include: quick-change two-speed wheel drive; centrally located column controls, wheel slide dials readable from any position.

Your Norton Man, a trained grinding engineer, will be glad to show you how the new Norton No. 200 cutter and tool grinder can help you modernize and economize in your plant. For catalog #1371, write to NORTON COMPANY, Machine Division, Worcester 6, Mass. *District Offices:* Worcester, Hartford, Cleveland, Chicago, Detroit. *In Canada:* J. H. Ryder Machinery Co., Ltd., Toronto 5.

NORTON
MACHINE TOOLS
75 years of . . . Making better products
. . . to make your products better

MACHINE TOOL DIVISION: Grinding and Lapping Machines — G & E DIVISION: Shapers • Gear Cutting Machines • Gear Induction Hardeners

Careful And Costly Control Grooms

SANDVIK SPRING STEELS

FOR SPECIAL PERFORMANCE

Checking the flatness of hardened strip steel.

Smoothness of strip surface is checked with a "Talysurf" surface measuring instrument which registers the profile depth magnified up to 50,000 times.

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SS-205

(Continued from P. 67)
systems engineering, and **J. D. Gum** and **J. T. Sharpsteen,** as asst. directors, systems engineering.

A. E. Christensen, appointed manager, engineering, Magnaflux Corp., Chicago.

R. C. Conover, named general works manager, Refractories Div., H. K. Porter Co., Inc., Pittsburgh.

Federal-Mogul Service Div., Federal-Mogul-Bower Bearings, Inc. — **R. K. Whitaker,** promoted to district manager, Memphis, Tenn., district.

OBITUARIES

J. L. Gordon, 61, vice president, Luria Bros. & Co., Inc., and district manager, St. Louis office.

W. A. Bergen, asst. to the president, The Symington-Gould Co., New York.

A. A. Buck, Jr., veteran representative, Continental-Diamond Fibre Corp., Newark, Del.

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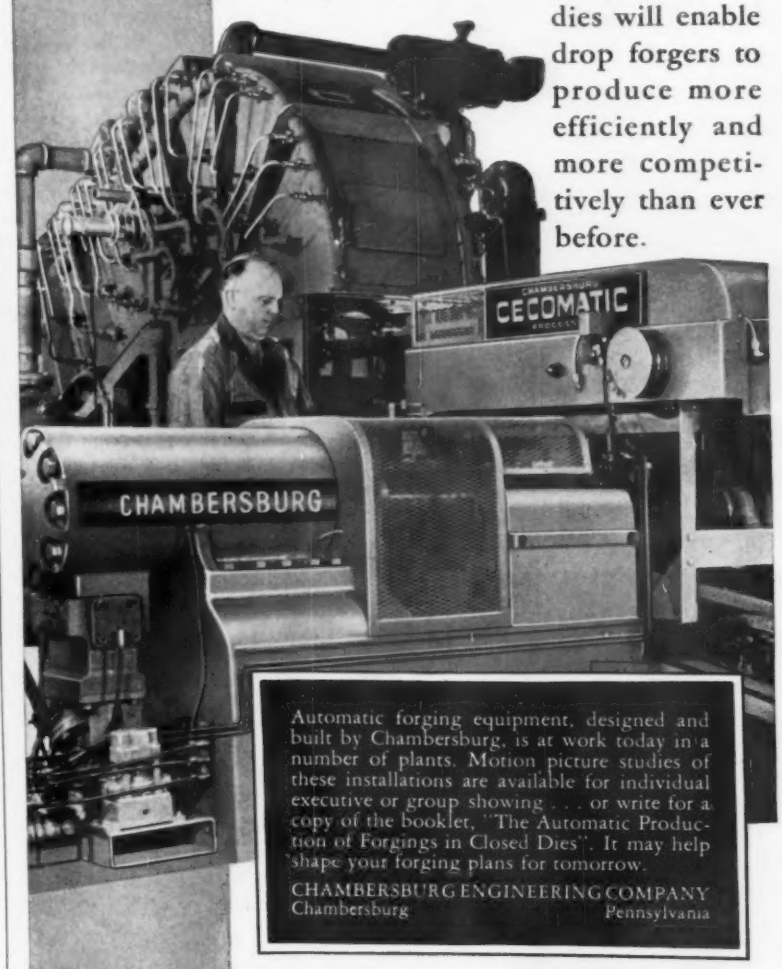

Automatic forging equipment, designed and built by Chambersburg, is at work today in a number of plants. Motion picture studies of these installations are available for individual executive or group showing . . . or write for a copy of the booklet, "The Automatic Production of Forgings in Closed Dies". It may help shape your forging plans for tomorrow.

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A bushing sleeve made of Republic ELECTRUNITE Carbon Steel Mechanical Tubing, 2⅝" O.D., 10-gage, was the answer. The sleeve is approximately 3" long and has a chamfer on one end. Holes are punched on circumference, and the other end of the tubing is expanded. Coarse threads are cut in the expanded metal on an automatic screw machine.

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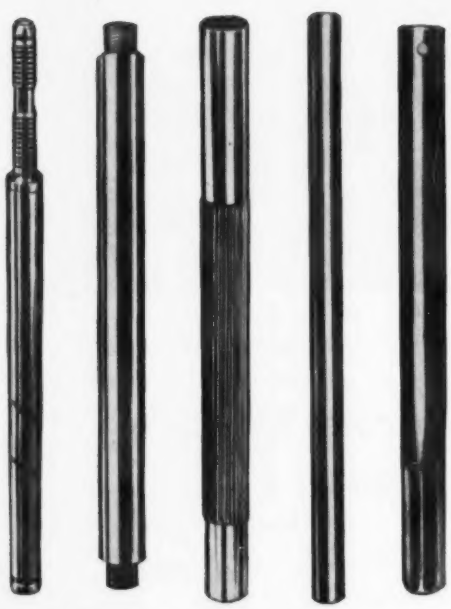
REPUBLIC NYLOK NUTS proved to be the solution for fast production and plus-safety features in the manufacture of an automobile steering mechanism, shown above. NYLOK nuts are ideal for automatic feeding, and give permanent, vibration-proof lock. Easy adjustment and re-use assured by permanent resiliency of the nylon pellet. Can be easily backed-off for parts inspection and adjustment. Write for data.



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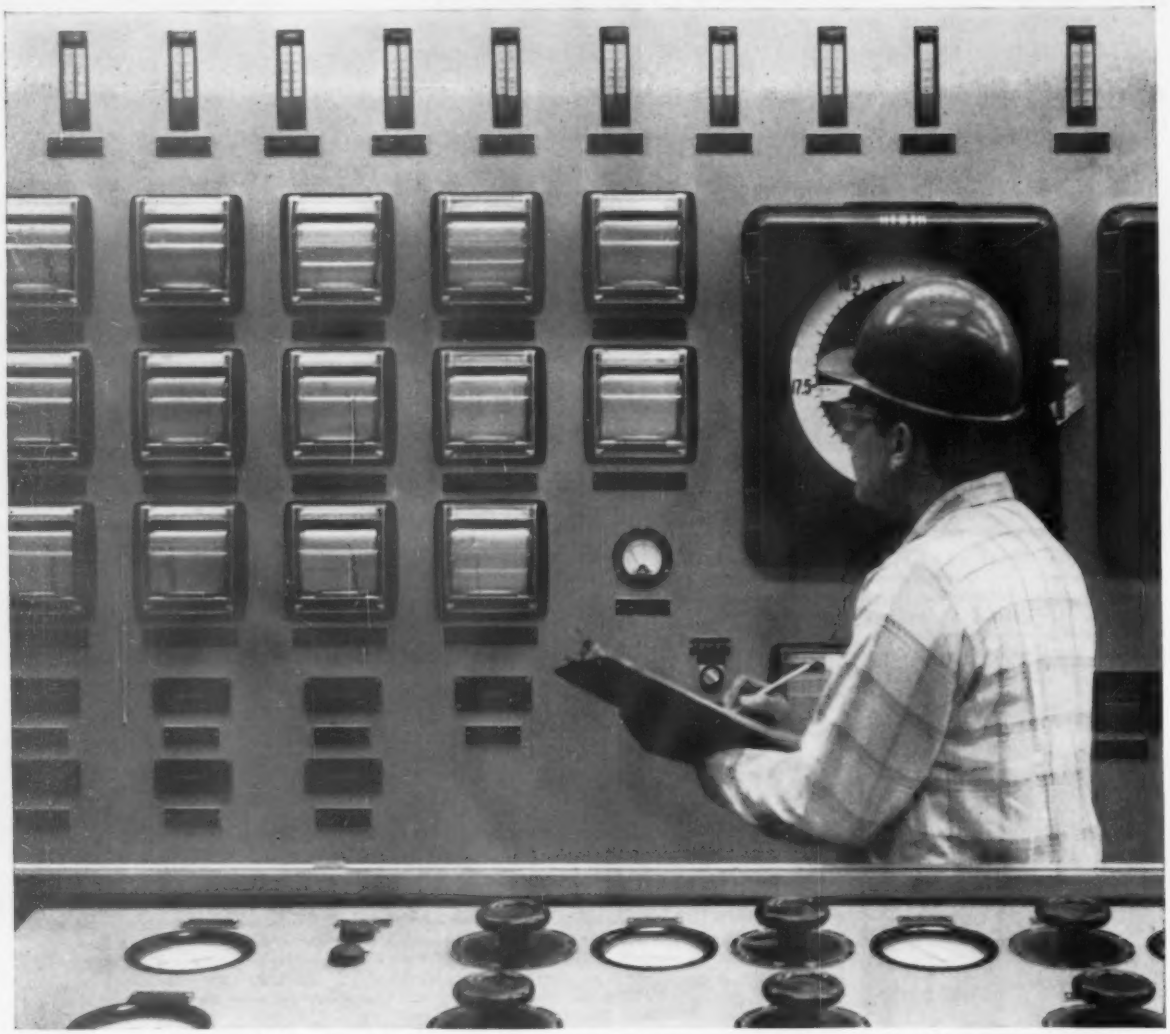

Foxboro control panel on Dwight-Lloyd Sintering machine at U. S. Steel's South Works, Chicago. Variables recorded by Foxboro Consotrols include temperature, pressure, level, flow and weight. Plant was designed and built by McDowell Company, Inc., Cleveland.

It's Foxboro "small-case" Consotrols for new U.S. Steel Sintering Plant

Savings in panel space — and in control room construction costs — were both achieved at U. S. Steel when they installed Foxboro "small-case" Consotrol* instruments for their new 5000 ton-a-day sintering machine at South Works.

Foxboro Consotrol Recording-Control Station met every U. S. Steel specification. Consotrols provide precise, dependable control — plus full-scale 4-inch records — in only one quarter the panel space required by conventional 12" instruments.

But panel savings are only part of the Consotrol story. Maintenance is easier, too. Not to mention accurate, dependable, trouble-free performance. Bulletin 13-18 has the complete story — write for it. The Foxboro Company, 807 Neponset Avenue, Foxboro, Massachusetts. *Reg. U. S. Pat. Off.*

FOXBORO

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SPEEDS REFINING: Three new oxy-fuel lances are ready for installation in openhearth. High oxygen injection rate (50,000 cu ft per hour) speeds refining of steel, boosts production to 100 tons per hour.

Lance Mixes Fuel and Oxygen To Boost Steel Production

Vital to the high openhearth-production rates, recently reported by Ford Motor Co., is a new oxy-fuel lance.

Now available is the story behind its development.

By C. L. Kobrin,
Metallurgical Editor

▪ Despite all the talk of new steelmaking processes to supplant the openhearth, there are some points that should be kept in mind. More than 80 pct of the steel made in the United States is made by the openhearth process. And steelmakers will be reluctant to switch to the new methods.

Moreover, there have been a number of recent developments that spell out new optimism for openhearth steelmakeers.

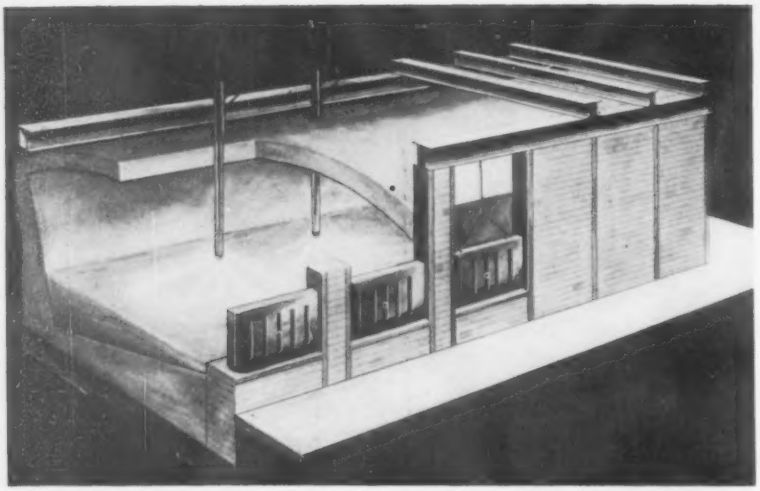
Boosts Production — One of these, an oxy-fuel lance, is a shot-in-the-arm for the industry. Testing of the lance at Ford Motor Co., River Rouge plant, Dearborn, Mich., for example, reveals a steel production rate double that of standard openhearth methods (The IRON AGE, May 26, 1960).

Developed by Air Products, Inc., Allentown, Pa., the lance drives very large blocks of heat into the furnace—and at a rapid rate. Key to its success is that it mixes and burns natural gas with oxygen to reduce the meltdown time. Then, the fuel is turned off and a high oxygen rate speeds up refining.

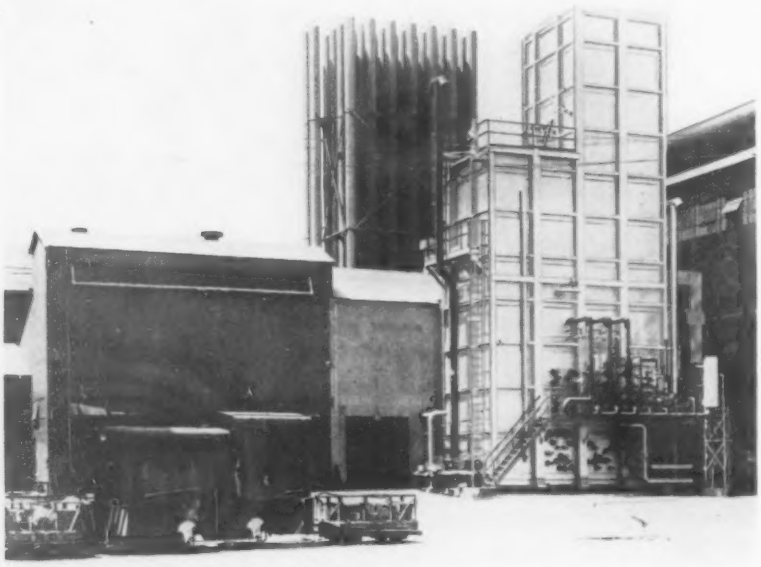
Temperatures up to 5000°F can be obtained—as compared to about 3400°F by standard openhearth practice. Installation of the lances presents no major problems. In most cases, it takes little or no

Typical Oxygen Usage

Application	Oxygen consumption, cu ft per ton steel
Scarfing	150
Openhearth roof jet	450–700
LD converter	1800
Oxy-fuel lance	1800



SHOWS LANCE LOCATION: Schematic of openhearth shows location of new oxy-fuel lances. Installation takes little or no furnace modification. Many U. S. openhearths now have basic roofs to meet high temperatures.



SUPPLIES OXYGEN: On-site plant at Granite City Steel Co., Granite City, Ill., is typical of those built to supply growing oxygen demands.

modification of the existing furnace.

Oxygen Use Booms—In the past few years, there has been a marked increase in the use of oxygen roof-lances in openhearth practice. Their success led to the development of the new lance—with its high capacity, and ability to mix fuel with oxygen.

What about costs? According to Air Products, the increased steel output and the savings in fuel should more than offset the cost of the oxygen. As for the lances, each should cost about $2500.

The outward appearance of the new oxy-fuel lance is much like the standard roof lance. It is water cooled, about 6-in. diam, and is made mainly of carbon steel. The upper end of the lance, including the nozzle which contains six ½-in. openings, is made of copper. The main difference between the two types of lances is, of course, the mixing device.

The oxygen-fuel mixture or straight oxygen — depending on whether the furnace is melting or refining—emerges from the nozzle at great speeds. It cuts through the slag to send heat directly into the metal.

Great Expectations — The full impact of these lances has yet to be realized. As E. F. Kurzinski, manager of applied research and development at Air Products says, "We are still at the base of the funnel. A lot of developmental work remains to be completed."

For example, each of the two lances used by Ford develops 30,000,000 Btu, per hour. (This is equivalent to 12,000 hp). However, lances capable of putting out 60,000,000 Btu per hour are being installed at a plant owned by National Steel Corp., Pittsburgh. Other lances of 100,000,000 Btu per hour rating are now on the drawing boards.

What sort of production rate is the openhearth steelmaker shooting for? Let's take a look at some figures.

Increase Tonnage — An openhearth which does not use oxygen enrichment produces about 20-30 tons of steel per hour. A furnace which is equipped with a standard roof-lance turns out about 30-45 tons per hour.

Compare these figures with the most widely accepted of the new oxygen steelmaking processes, the LD, which makes about 85-100 tons of steel per hour.

A clue to these different production rates lies in the amount of oxygen consumed.

Openhearth roof-lance practice in the United States, before the advent of the new oxy-fuel lance, called for the use of 20,000-40,000 cu ft of oxygen per hour. The LD

converter, on the other hand, uses about 150,000 cu ft of oxygen per hour and up depending upon furnace size.

Nears LD Output—What about Air Products' new lance? The current model that Ford Motor Co. is using has a capacity of 50,000 cu ft of oxygen per hour. And tests at Ford reveal that its openhearth output (60-100 tons of steel per hour) approaches that of current LD practice.

One can only speculate what the openhearth production rate will be when the larger lances at the National Steel Corp. plant go into operation. But it's expected that the output there should attain at least 150 tons of steel per hour.

The new lance is not restricted to openhearth usage. It can be used to speed up any melt-down and refining operation—ferrous or nonferrous, reports Mr. Kurzinski.

Thus, the lance can also be used in the LD converter. Another potential application is in the refining of copper. Larger furnace charges and subsequent larger outputs should be possible.

Signs of Progress—Development of the new lance is a natural step in the evolution of the openhearth. Basic-brick roofs, which can withstand the high temperatures of the oxy-fuel lance, are already installed in many of the openhearths in this country.

Now, effort will have to be directed towards the development of accessory equipment to handle the increased potential of a furnace.

More ladles and ingot molds—posssible of new design—will be needed. Soaking pits will have to be larger. Provisions will have to be made to handle increased amounts of slag. Instruments will be needed for making rapid chemical analyses.

Must Keep Pace — Refractory manufacturers also will have to keep pace with the higher temperatures generated by the new lance design.

One of the most important factors to be considered is that of charging. Ford's technique is to add molten metal right after the scrap and other solids have been added and the doors banked. Ford practice also calls for the substitution of burned lime for limestone to conserve heat.

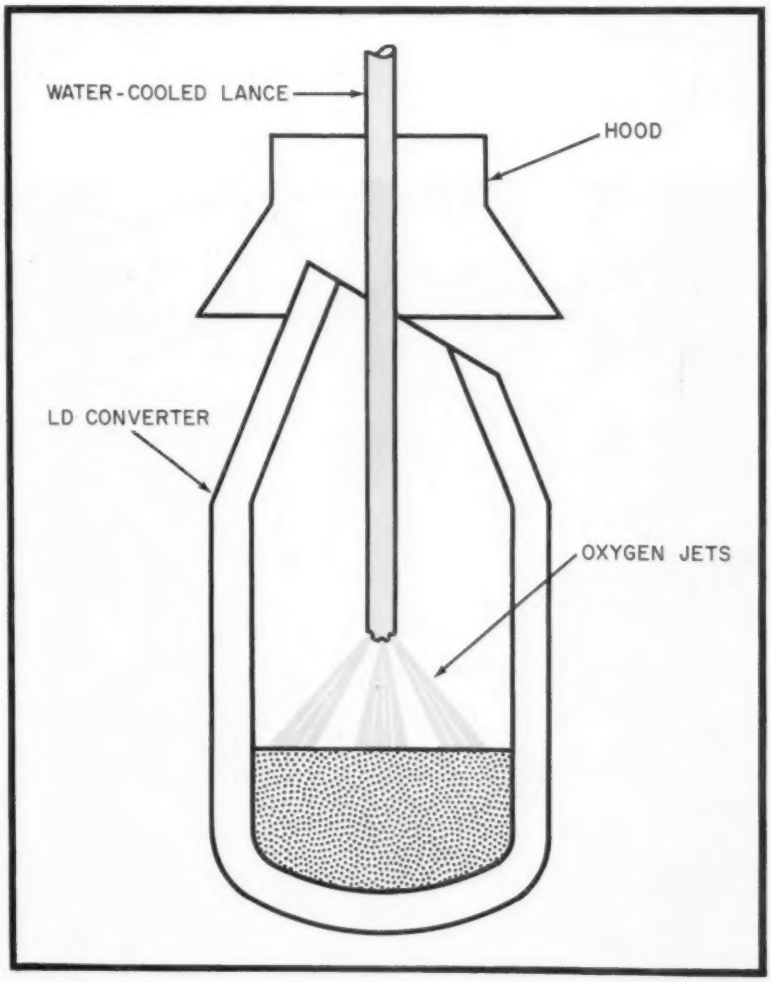
This technique is, in part, responsible for the high production rate. But when the new, higher-capacity lances are ready, production rates should be even greater. And new, faster-moving, charging machines will be required.

To meet the increasing needs for oxygen as a basic material in steelmaking, oxygen producers will have to build new and greater capacity plants throughout the country.

Air Products, Inc., for instance, has scheduled the installation of five new oxygen plants by the end of 1961. The first one to be completed, for Granite City Steel Co., Granite City, Ill., will be started up by the end of the year.

Reprints of this article are available as long as the supply lasts. Write Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Lance Also Spurs LD Process



VERSATILE TOOL: The new lance can be used to speed up any melt-down and refining operation. Thus, it can also be used with the LD converter.

Direct-Chill Casting Method Improves Aluminum Alloys

Who says competition isn't healthy. It must be if it sets quality as a goal.

Here's where progressive thinking pays off in the aluminum industry.

By R. R. Irving,
Welding Editor

■ To use modern equipment, you must "think modern." Take aluminum for example. The better the ingot, the better the end product. This puts the burden of development on the shoulders of the metallurgist. He must explore new methods and new equipment. If he doesn't, then his ingot will remain the same.

The aims at Quaker State Metals Div., Howe Sound Co., Lancaster, Pa., were spelled out. Management knew that an improved ingot, aside from the quality angle, would respond more rapidly to rolling techniques. Quaker State is a major producer of sheet aluminum.

Green Light—So engineering got the "go ahead": Find the needed tools. The search ended in success. The "tools" consisted of a new casting machine and two pellets. Combined, they produce an ingot that has smaller grains that approach an equiaxed condition.

This modern method also reduces the trend toward dendritic growth in the ingot—almost eliminating it in some alloys. As a result the tendency for "inverse segregation is greatly reduced." Despite these added controls, production is swift enough to meet the high demands of Quaker State's rolling mills.

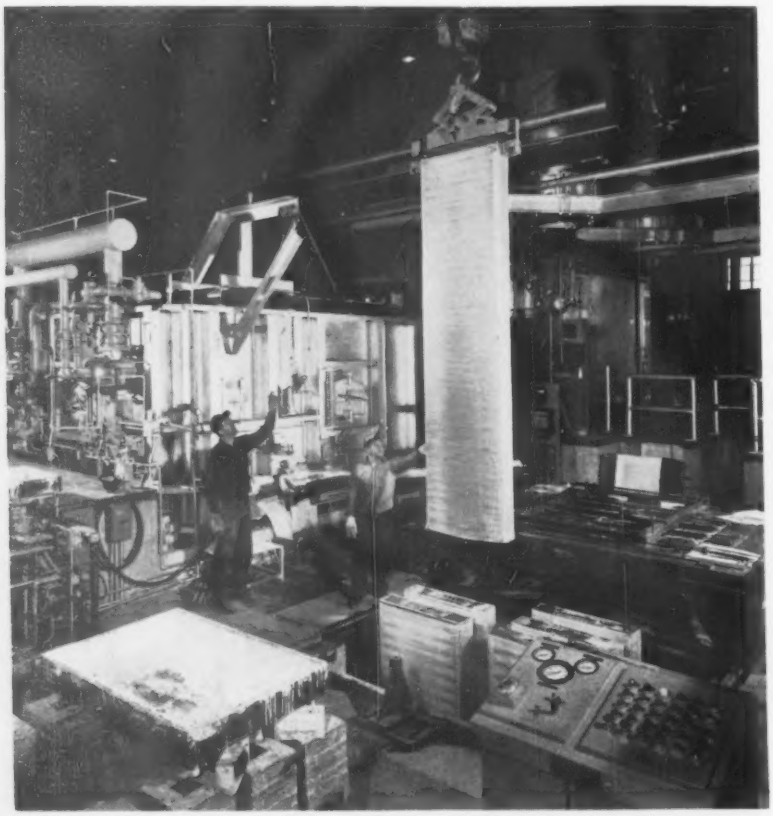
Safe and Sound—Chlorine isn't needed at all. As a degasser, elemental chlorine can create certain hazards among workers (unless it's closely controlled). Results to date at the Lancaster plant indicate that a more complete degassing job is being done by the new method over the use of chlorine.

The casting machine, a vital piece of equipment, receives the molten alloys through a trough from the melt furnaces. The aluminum is filtered at a controlled rate through glass-cloth screening. The metal is then cast in sets of six ingots in the vertical casting unit.

Direct Chill—Each nonheat-treatable alloy ingot is 7½ in. thick and 11½ ft long. The casting machine, a product of Loma Machine Mfg. Co., New York, can turn out up to 25,000 lb of aluminum per hour. The unit functions on the "direct chill" principle.

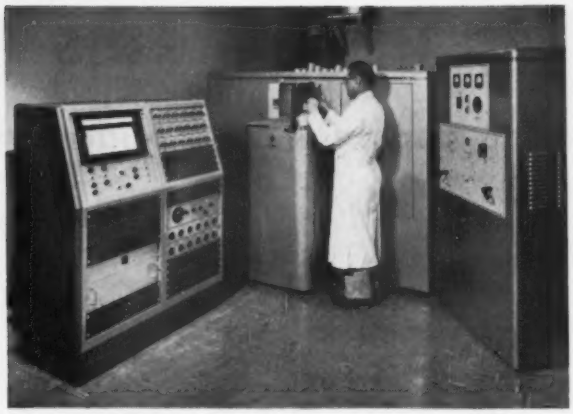
The machine is designed and located to insure steady operation. Casting can be carried out from either one of the two banks of furnaces. It now handles from five to eight ingots per drop, depending on width. In drop weight, the unit can handle up to 30,000 lb.

Solid Fluxes — The two pellets serve the purpose of a degasser and a nucleant, respectively. Both of



SOLID ALUMINUM: New casting setup produces quality ingots using the "direct chill" principle. Eight ingots have been cast at one time.

AROUND THE CLOCK: Continuous flow of molten aluminum moves from the furnace to the casting station.



QUALITY TEST: Lab equipment supplies rapid analysis of all aluminum alloys to control product quality.

them are made by Foundry Services, Inc., Cleveland. Such solid fluxes, as soon as they're fed into the melt, decompose to produce gases.

These gases flush out both hydrogen and oxides. Naturally, if either one of these contaminants remains during cast, the quality of the finished metal suffers. At Quaker State, however, the aluminum is grain refined to produce fine structure—an aid to quality in the end product.

A pellet, called Nucleant 2, releases titanium, boron and carbon. All three of these elements combine with one another and/or with aluminum to form seeds for individual grain production.

Another Function—A final degassing also results from the decomposition of hexachlorethane (a component of Nucleant 2). This helps distribute titanium, boron and carbon to best advantage. Another pellet, called Degaser 450, combines degassing and grain refining.

Nucleation offers random sites for many millions of crystals. The more sites there are, the finer the overall grain structure.

The Big Tools—The cast house is made up of equipment for melting, casting, scalping, sawing and induction melting. The melting facilities consist of two banks of Swindell-Dressler melting and holding furnaces. Each bank has its own 60,000-lb capacity melter and 35,000-lb holder. Natural gas is used to fire the furnaces. And each one is fired by 9 million Btu per hour burners.

Furnace designs permit simultaneous charging, transferring and tapping. What happens when the natural gas supply is cut off? Stand-by oil fuel systems take over.

Chips are not wasted. They are fed into the induction melting furnace at a very high recovery rate, then returned to the line.

Properties Respond to Direct-Chill Method

*ALLOY	1100	3003	3004	5005	5050	5052
Thickness Range, in.	0.051 to 0.249	0.051 to 0.249	0.051 to 0.249	0.114 to 0.249	0.114 to 0.249	0.032 to 0.249
Minimum Ultimate Tensile Strength, psi	11,000	14,000	22,000	14,000	18,000	25,000
Minimum Yield Strength, psi	3500	5000	8500	5000	6000	9500
Hardness, R 15-T	20	37	57	37	50	65
Elongation in 2 in., pct	30	25	18	24	22	20

* Each alloy received H-O temper (strain hardened and annealed)

Ratio Systems Appraise Sales

Managerial Controls Guide Overall Sales Efforts

By S. A. Tucker—Partner, Martin & Tucker, Little Neck, N. Y.

Tight competition calls for a scientific sales program.

Simple tables and charts predict vital factors. These include: future sales trends; quotation activity; and buyer-seller incompatibility.

▪ As competition shifts into fringe-expense areas which are highly refined, management must become more scientific.

Years ago, the chance of getting a "buy" in materials or in being in a less costly labor market presented sales advantages. Then the minimum-wage law became the great equalizer. And today's small differences in most material-costs no longer make a "shopping" effort worthwhile.

As a result, management has to police every cost-producing area to build up profits. These profits depend upon sound management decisions.

Study Profit Areas — To reach sound decisions, management must have the facts. A managerial-controls (or MC) technique is the key to meaningful data. MC allows management to study and preserve profit areas. It also can be used to appraise and delete loss activities.

The MC technique develops ratios from heretofore unrelated data—normally found in company records. This article deals with the construction of ratios which appraise a salesman's efforts.

Control is made possible by interrelating the movements of the

PLANNED PROFITS

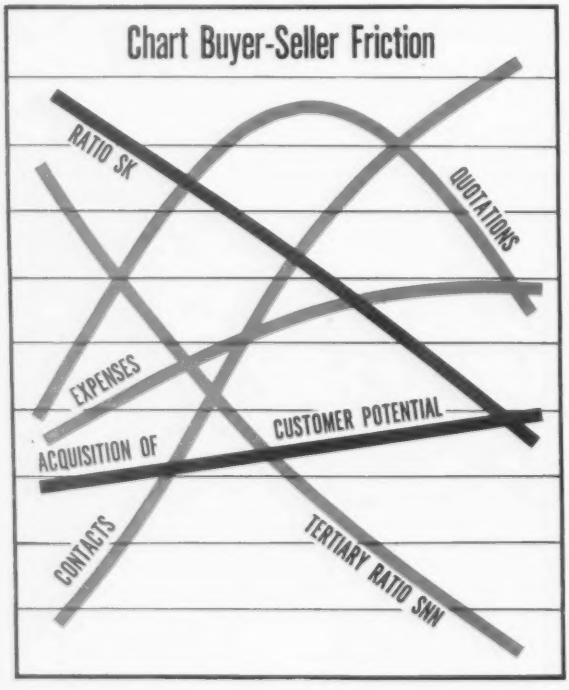
This is the third of a four-part series of articles on planned profits.

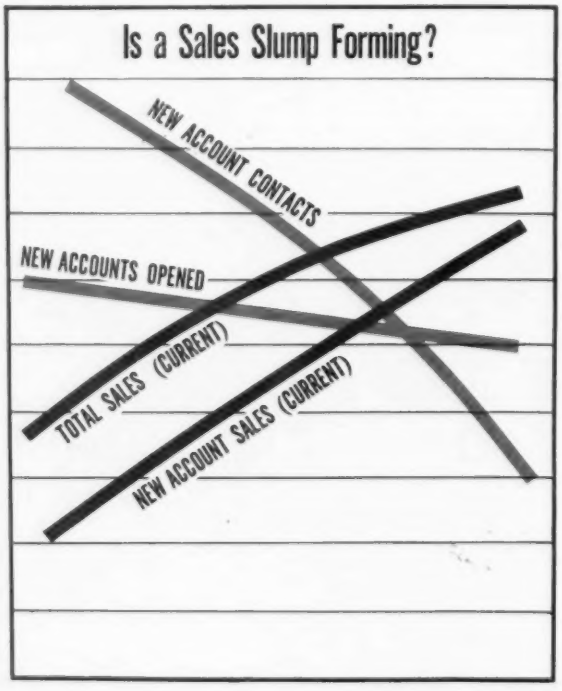
The first article discussed controls for management.

Last week, Mr. Tucker covered production controls.

Next week's final article takes up the subject of control of capital evaluation.

Ratios Prove New Accounts Are Needed





various ratios over a period of time. This predicts their behavior patterns.

All ratio examples shown deal with the man. However, these same ratios can be used to appraise product activity. The latter use assesses the value of a product mix.

Use Primary Data—Where do you start? A sample of primary sales data appears in table form. Elementary sales ratios—developed from the primary data—appear just below the tabulated sales data.

These ratios evaluate a salesman's productivity, effectiveness, economy and response to direction from management. In presenting these brief examples, it's assumed that sales management is armed with realistic targets. These targets lend support to the company's economic needs.

Consider ratio SV. This ratio shows what portion of the total sales (of a man or a department) was sold to new customers. This ratio is important to top management if one of the company's goals is to gain new customers.

Check Quotation Activity—Ratio SXIII measures quotation activity. It shows by proportion the number of new contacts—made by individual salesmen or by the department—that result in quotations.

This is an "activity" rather than a "productivity" type of ratio. Why? Because this ratio doesn't predict just what accounts will be sold. And it doesn't reflect the amount of sales resulting from quotations.

If the sales manager knows just what success the man or the department had with past quotations, he can predict future "quotation activity."

Tertiary ratio SJ (in the last table) shows the quotation acceptance. This can be applied to ratio SXIII to temper its value.

Conform Value—The value of ratio SXIII is important only when it's confirmed by other ratio movements. A high value can result from a few contacts. Or it may be the result of a large number of quotations.

Ratio SXXXVIII reflects the productivity-return index. It compares the dollar value of sales and quotations with the number of accounts sold and quoted.

Obviously, this is a composite ratio. It reflects both the average account sale and the average quotation. This gives a proof-of-the-pudding index for any period being checked.

There is no tempering of the value to account for past successes like quotation acceptance or mortality. Ratios of this type can be expanded to cover new and existing products.

Overall Picture — Cumulative sales data appear in another table. This table presents monthly- and cumulative-performance data. Tertiary sales ratios, gleaned from the table, are listed in another table just below the cumulative data.

Tertiary ratios serve as a vital MC tool. These living ratios give management economically-weighted data. Consider ratio SA. This ratio

Construct Elementary Ratios

DATA TABULATED	CODE IN RATIO: Number	CODE IN RATIO: Dollars
Total Number of Contacts	1	—
Total Amount Sold & Quoted	—	12
Total Existing Customer Contacts	2	—
Total Existing Customer Sales	—	13
SOLD NEW Products	3	14
SOLD EXISTING Products	4	15
QUOTED NEW Products	5	16
QUOTED EXISTING Products	6	17
Total New Customer Contacts	7	—
Total New Customer Sales	—	18
SOLD NEW Products	8	19
SOLD EXISTING Products	9	20
QUOTED NEW Products	10	21
QUOTED EXISTING Products	11	22
Total Customers Sold	23	25
Total Customers Quoted	24	26

RATIO CODE	TITLE	FORMULA
SV	New Customer-Sales Productivity	$\frac{19+20}{25}$
SVII	New Accounts Direction	$\frac{10+11}{1}$
SXIII	Quotation Activity	$\frac{24}{1}$
SXIX	New Business Attempts	$\frac{21+22}{25}$
SXXIV	Average New Customer Quotation	$\frac{21+22}{10+11}$
SXXXVIII	Productivity-Return Index	$\frac{12}{23+24}$

reveals a vital fact in judging the progress of a salesman—or the entire sales department.

Ratio SA relates the cumulative sales to date, to the customer's estimated yearly potential. The potential is linearly protracted to date. This ratio requires policing of the denominator's accuracy — the customers' potential.

If the potential is underestimated, the ratio becomes unnaturally high. This gives the salesman an unfairly high appraisal.

Plan Attack—How does this ratio serve? It uncovers improper assignments of "high potential" to low producers. At the same time, the elementary ratios point out which men are low producers. They also establish which men handle expenses most wisely.

But it's ratio SA that shows the impact of a salesman's productivity. It also predicts future success in getting results from the potential assigned to him.

Very often, this control decides the rotation of men and accounts. End result is an overall increase in the department's potential acquisition.

Quotation mortality is reflected by ratio SK. This ratio considers two important factors. Only some quotations result in sales. The rest die.

Money Well Spent — Ratio SJ shows the portion of the total-dollar activity that turns into sales in a given period. Both ratios SK and SJ measure the effectiveness with which quotations are solicited and accepted.

Some companies try to quote on everything that comes along. They act like a quotation mill. They pour money into worthless quotes. This makes planning difficult. Ratio SJ shows to what extent a sales department should quote selectively.

In the managerial control of sales efforts, interest centers on the interweaving of the ratios. A pattern-producing set of values can thus be plotted.

The first chart shows how to diagnose buyer-seller incompatibility. This chart and its mate act as guides for sales management. They show how sales can react to an upper managerial directive to open new accounts.

Check Tertiary Performances

DATA TABULATED	CODE IN RATIO
Customers' Estimated Yearly Potential	59
Customers' Cumulative Potential to date	60
Sales this Period	61
Cumulative Sales to date	62
Contacts this Period	63
Quotations this Period	64
Cumulative Quotations to date	65
Total Number of Companies Contacted this Period	66
Total Number of Companies Quoted this Period	67
Total Number of Companies Sold this Period	68
Total Number of Different Companies Sold to date	69
Total Cumulative Expenses to date	70
Cumulative Salary Expense to date	71
Cumulative Entertainment Expense to Date	72
Cumulative Automobile Expense to date	73
Cumulative Contacts Made to date	74

RATIO CODE	TITLE	FORMULA
SA	Customer Potential Acquisition	$\frac{62}{60}$
SG	Sales-Expense Index	$\frac{62}{70}$
SJ	Quotation Acceptance	$\frac{62}{62+65}$
SK	Quotation Mortality	$\frac{65-62}{65}$
SL	Expense Productivity	$\frac{65+62}{70}$
SAA	Sales, Expense & Contact Effectiveness	$\frac{\text{Ratio SG}}{74/69}$
SCC	New Account Probability	(Ratio SXIX) (Ratio SJ)
SFF	New Sales & Account Performance	$\frac{19}{23}\times\frac{19}{25}$
SHH	New Customer Sales-Contact-Account Performance	$\frac{\text{Ratio SV}}{(7/1)\,(7/8+9)}$
SII	Current Trend Index	$\frac{61}{68}\times\frac{69}{62}$
SNN	Overall Performance Index	Ratios SA × SG × SJ

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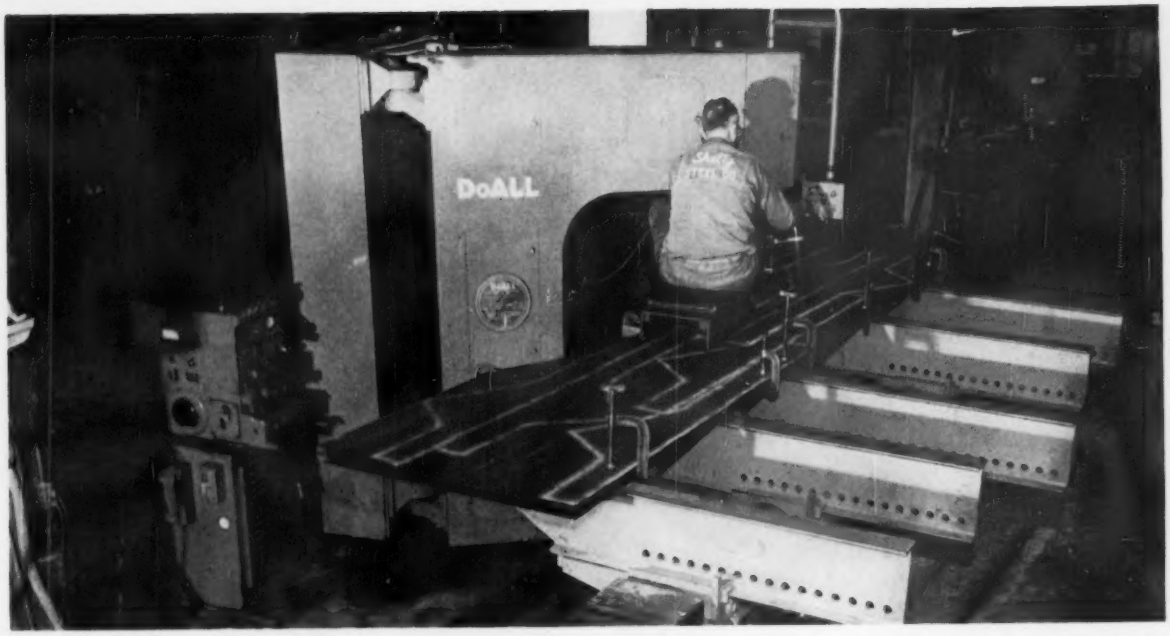


ELIMINATES WASTE—Maximum use of the cross-rolled plate is made possible by proper layout methods. Templates are used to lay out the parts on the plates—these are positioned for best yield.

Giant Saw Cuts Rolled Plate

When cross-rolled plate becomes a necessity—cutting becomes a problem.

Look the situation over, you might save time and money with a new saw.

■ With the advent of highly stressed jet engine and missile parts, materials are needed that produce equally high longitudinal and transverse strengths.

The Aircraft Research and Testing Committee came up with one answer—cross rolled plate. Such a material would normally be tough to cut. But with the use of a new giant band saw, sectioning of even the largest plates is done with low cost efficiency.

Shultz Steel Co., South Gate, Calif., specializes in cross-rolled plate and has pioneered much of its technology. They were quick to realize that with proper cutting facilities cross-rolled plate items could be made available for off-the-shelf procurement.

Answers the Need—The DoAll Co., Savage, Minn., was called in to provide a heavy-duty saw for the job. Their "Pan Arm" contour saw filled the bill.

The Pan-Arm saw provides the preferable method because, unlike flame cutting, it does not disturb metallurgical properties. Also, close tolerances can be held, the usual finishing allowance being only ⅛ to 3/16 in.

The unit consists of a four wheel, variable speed band saw frame suspended from an articulated support. It will make cuts anyplace within a 99 sq ft work area, and straight cuts up to 17½ ft long.

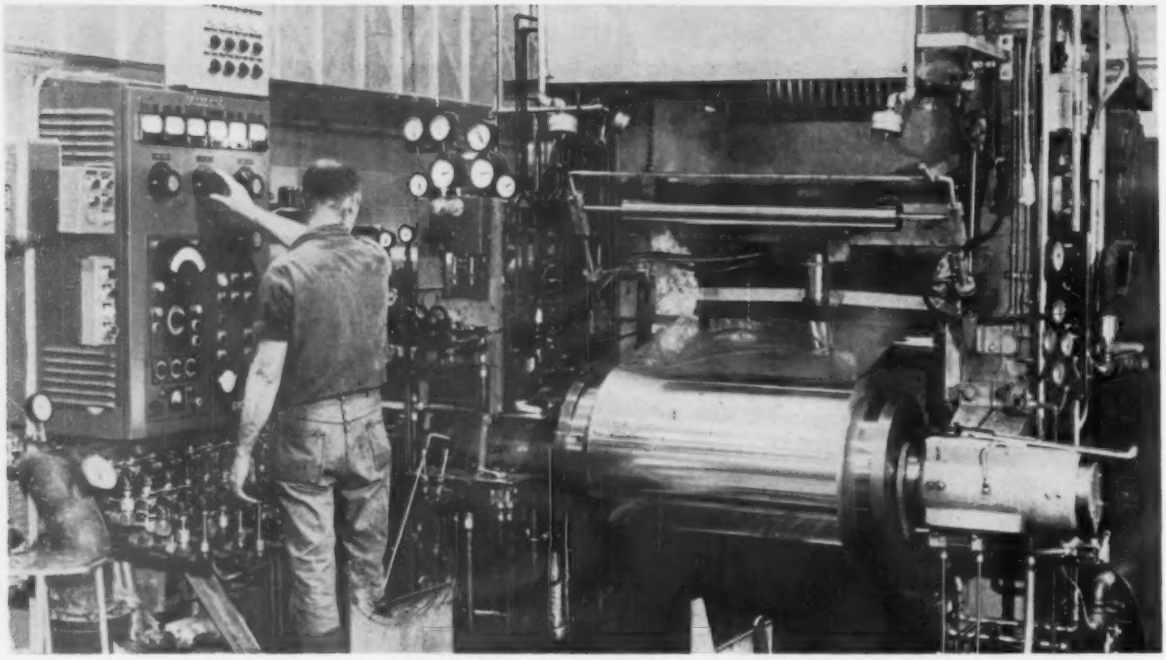
Proper Control—Contours of almost any complexity can be followed by the operator. Control is achieved by linking upper and lower saw band guides to a torque-motor and feed-wheel.

When the steering wheel is turned in any direction, both upper and lower guides turn correspondingly. This permits the feed wheel to direct the feed force in the direction that the saw band is aimed.

Flexible Design—A work table designed and built by Shultz Steel suits their particular application. It travels on 50 ft tracks which pass through the total cutting area. This enables them to handle plate larger than the 99 sq ft working area of the Pan-Arm.

Five table support arms can be set individually along the length of the table as well as in and out. This permits parts of nearly any shape to be cut from the plate. In many cases the operator actually sits on the work.

The Pan-Arm unit is equipped with a band welder. For internal openings, the band is cut, threaded through a drilled hole and then welded together again.



TIGHT TOLERANCES: After the thickness is set, the X-ray gage automatically measures and controls foil thickness. The gage takes continuous readings. Accuracy is within ±1 pct in the 0.002-0.025-in. range.

Non-Contacting X-Ray System Programs Aluminum-Foil Mill

Modern X-ray controls maintain the thickness of aluminum foil during rolling operations.

Result: Every pound of metal yields more square feet of controlled foil-surface area.

■ To match growing needs for aluminum sheet and foil—and to cut production costs—the Mirro Aluminum Co. has turned to X-ray gages. These gages serve a dual role. They double as non-contact micrometers and automatic controllers on high-speed aluminum-foil mills.

Merle Hutchins, chief metallurgist at Mirro's new $12-million rolling mill at Manitowoc, Wis., cites three factors as proof of the gages' value. These factors include: savings in material, more uniform products and better customer service.

Higher Output — "With the installation of a modern X-ray gage control system," says Mr. Hutchins, "we can continually hold closer to a desired metal thickness. As a result we get more square feet of surface area per pound of metal while still remaining within commercial thickness tolerances."

Mirro uses XactRay gages made by the Weston Instruments Div., Daystrom, Inc., Newark, N. J., on two mills in its new plant. One gage permits automatic operation of a 48-in., hydraulically-adjusted, foil mill at speeds up to 2000 fpm.

Another gage—on a heavy-duty, 60-in. cold mill—maintains sheet tolerances by regulating the screw-down rolls. This gage also compensates for shifts from one aluminum alloy to another.

Less Waste—Mirro's fabricating and packaging operations use about 40-million lb of aluminum sheet per year. "Since a manufacturing variation of 0.0001 in. on the average gage rolled could result in excess usage of 160,000 lb of metal per year," reports Hutchins, "it is understandable why Mirro is extremely conscious of the value of accurate gage control."

Output from the new mill will reach 60-million lb of aluminum per year by 1961. Mirro expects $100 million in sales by 1969. Company officials count on "scanned" production to help meet these goals.

"The new rolling-mill operations will change our entire perspective

on rolling methods," Hutchins states. Previously, Mirro cast and rolled 100-lb slabs and coils on much slower equipment. All handling was done manually.

In the new mill, the company casts slabs weighing up to 6000 lb. The new rolling equipment also handles 3000-lb coils. Being much larger and faster, the new equipment requires the most up-to-date gaging methods.

Cuts Costs — With XactRay gages, Mirro obtains three major advantages. Sheets stay within preset tolerances. Press-department complaints—over off-gage materials which cause trouble during forming —have fallen. And metal costs per square foot of sheet are down.

Precision is the keynote. To keep the foil equipment dust-free the entire mill is enclosed in an air-filtered, pressurized room. This precludes contamination problems. It also prevents dust from causing pinholes in the foil.

Mirro's foil mill handles coils up to 48 in. wide. It rolls thicknesses from 0.0007 to 0.025 in. Average coil length of household foil (36½ in. wide and 0.0007 in. thick) is about 15½ miles. The mill holds tolerances over the entire length to within ±4 pct.

Energy Beam—On the rolling line the X-ray energy source transmits a pencil-thin beam from below the aluminum sheet. This beam projects upward to a service unit above the sheet.

Changes in the radiation's intensity are transmitted to a pick-up unit. This allows the pick-up unit to measure the thickness of the moving aluminum. It also triggers elements in the console cabinet. These elements convert all variations into terms of percentage from nominal thickness.

Foil-mill operators watch the console-mounted dial. They note any change from the zero-centered reference point. A red-warning light flashes when the preset deviation is exceeded.

Gage accuracy is within ±2 pct in the range of 0.0007 to 0.002 in. Accuracy is within ±1 pct in the 0.002- to 0.025-in. range.

Automatic Compensation — A two-man crew operates the foil mill. They start the metal into the rolls and remove it from the rewind at the end of the mill. After the thickness is set, the gage automatically compensates for deviations by speeding up or slowing down the mill—or by increasing or decreasing the pressure on the rolls.

Without automatic gaging, thickness checks must be made from edgecut samples taken "on the fly."

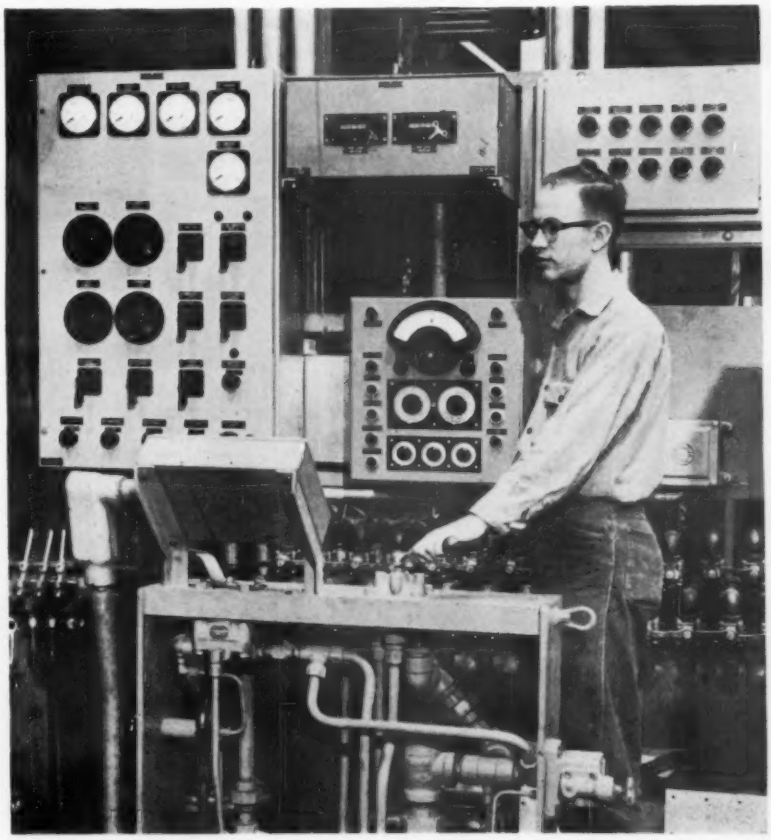
The non-contacting X-ray gage takes continuous readings. It regulates the mill and automatically shuts down all equipment if the sheet breaks. All operations are also halted when a coil is completed.

Changes in foil speed have no effect on gage accuracy. The correction signals are instantaneous. This is true whether the foil is making its first pass at 800 fpm, the intermediate pass at 1500 fpm, or the final run at 2000 fpm.

Room for Expansion — Mirro's fast rolling makes the old gaging method impossible. Heating of the rolls is a factor in causing sheet variations even with a slow foil mill. But on Mirro's rapid mills it's a major problem. It can be solved only with automatic, continual adjustment of the rolls.

Keeping the gage in running order is no trouble, reports Tony Packowski, the company's electronic engineer. "Aside from a periodic inspection of the electron tubes," he says, "the gage pretty well runs itself."

Mirro's officials point out that the use of foil continues to grow. Their plans include provisions in case the company expands in the foil field. The present foil room could contain two more mills. An adjoining bay has space for three more.



CONSOLE DIAL: Operator checks reference dial to note foil thickness. A red-warning light flashes whenever the preset deviation is exceeded.

Key Elements Amend Columbium For High-Temperature Service

Oxidation is the bane of many promising metals — including pure columbium.

But research has come up with the answer: columbium-base alloys that combine strength and oxidation resistance up to 2550°F.

▪ To the practical engineer, there is only one "wonder" metal—steel. Nevertheless, to exploit fully the latest developments of modern science, stronger, lighter and more heat-resistant alloys are constantly needed.

In 1956, the metals research laboratories of Union Carbide Metals Company embarked on an intensive research program on columbium-base alloys. Result: the recent development of several new alloys to meet the brutal demands of missile and atomic applications.

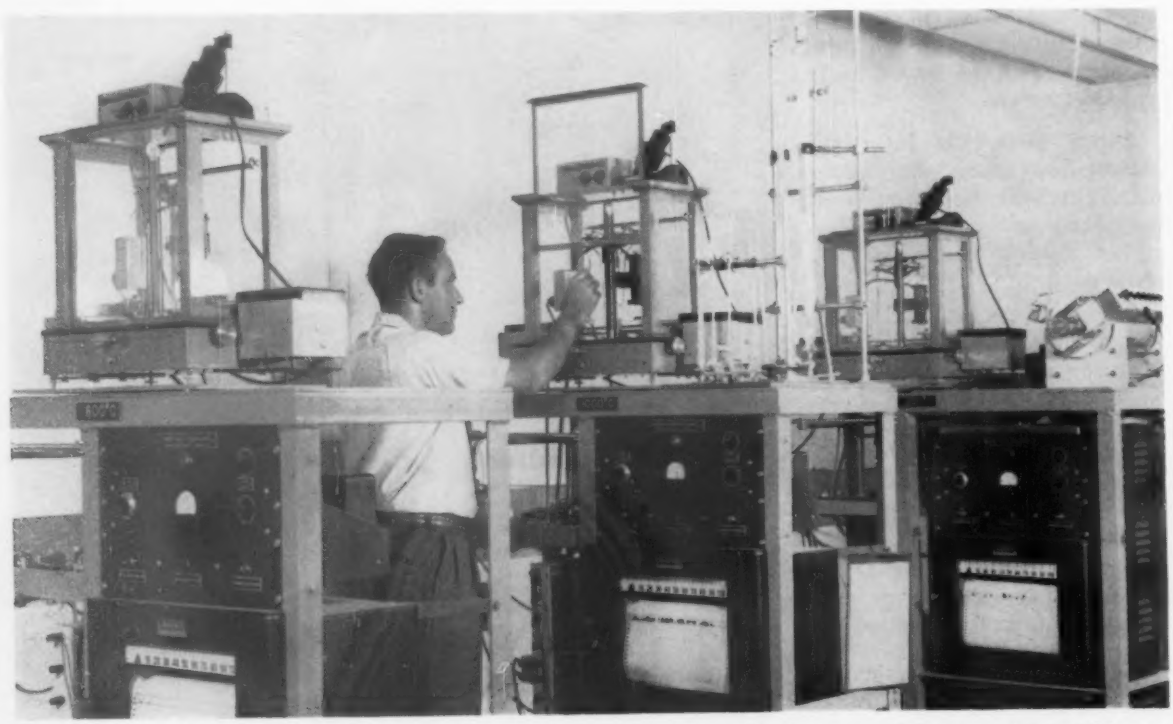
Good Start—Columbium was a promising base at which to begin. A glance at its properties reveals: high melting point (4475°F); lower density than nickel or cobalt; good corrosion resistance; and top fabricability in the pure state.

Unfortunately, columbium oxidizes rapidly on exposure to air above 1000°F. Thus, it lacks the properties of a structural material for jobs that require high strength. This is particularly important at high temperatures where deformation or creep might become a problem.

But since a high-melting point alloy usually has good properties at high temperatures, it's reasonable to expect that the high-melting point of pure columbium could sooner or later be translated into a system of creep-resistant compositions.

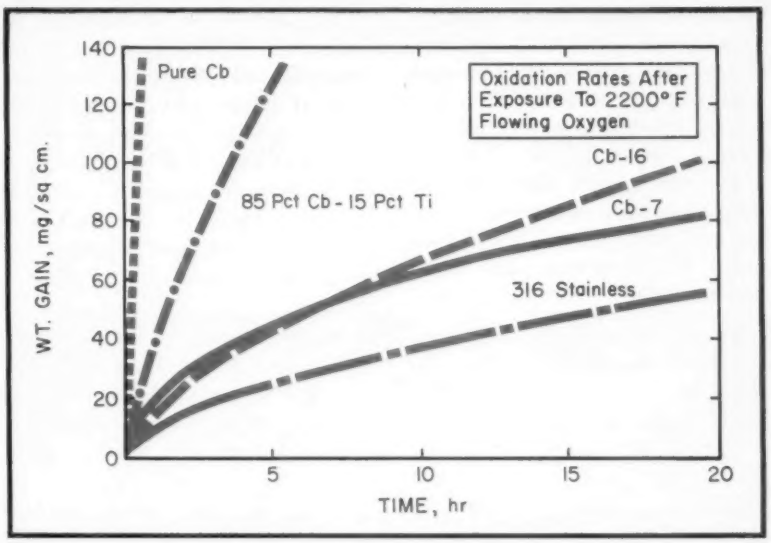
Forms Solid Products—There's another favorable factor. Although columbium reacts rapidly with oxygen and nitrogen, it forms solid oxidation products below 2650°F. Alloys of columbium, therefore, are not prone to the catastrophic oxidation sometimes experienced with other alloy systems.

Researchers then faced the problem of designing improved columbium-base alloys without reducing



CHECKS OXIDATION RATES: Automatic-recording balances measure the oxidation rates of columbium-base alloys. Platinum-wound furnaces can provide test temperature up to 2200°F.

Resists Oxygen Contamination



the basic advantageous traits of the pure metal. Thus, the approach taken was to study the oxidation resistance of such alloys along with the best methods for strengthening columbium.

Any research and development project for new alloys also involves a number of other engineering problems. And the solution of these problems often spells success or failure for the alloy-research program.

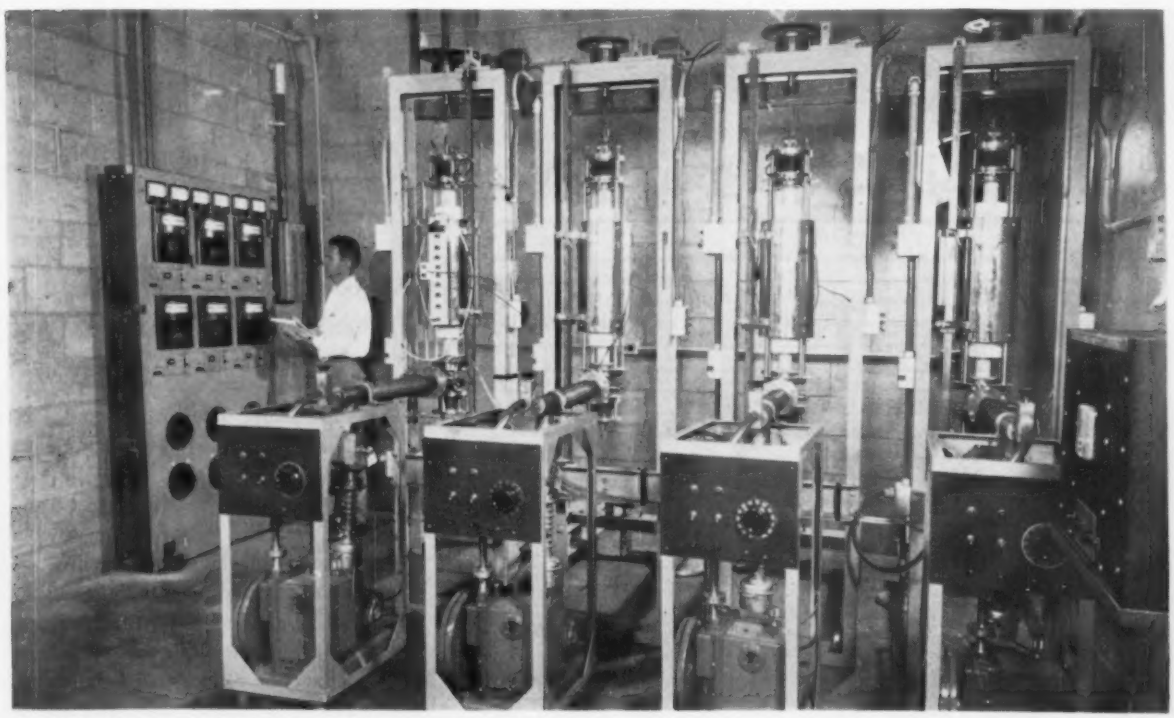
Needs New Techniques—For example, vacuum arc-melting techniques useful for titanium or molybdenum base alloys could not be directly applied to columbium-base materials without drastic changes in operating conditions.

High speed extrusion techniques and special annealing, cutting, trimming, and pickling procedures all had to be set up. Equipment had to be specifically designed for rating the properties of the experimental alloys.

Upon the successful development of these techniques hinged the ability to carry out the main programs of improving oxidation resistance and strength.

Predicts the Effects—At first, an empirical approach was used in both areas to correct accepted theories of alloying behavior. This procedure allowed the accurate prediction of the effects of various alloying elements.

Depending on the service temperature, mechanisms of high-temperature strengthening were outlined. Alloying elements whose atomic sizes



OBTAINS MECHANICAL PROPERTIES: High-vacuum creep-rupture units are used to determine the tensile properties of columbium-base alloys for punishing high-temperature applications.

were the furthest removed (either larger or smaller) from that of columbium atoms prove, in general, to have the greatest strengthening effect. This was shown to be especially true below 1600°F. But their valence also had to be markedly different.

However, even more effective were those alloying materials which did not overly decrease the melting point of columbium and which formed stable carbides or oxides.

Result: New Alloys — Careful control of these variables led to the design of alloys with high strength and excellent fabricability. Cb-74 (85 pct Cb-10 pct W-5 pct Zr), for example, exhibits superior high-temperature mechanical properties.

At 2200°F, its ultimate tensile strength is 44,800 psi and its yield strength is 42,400 psi. At the same time, it is fabricable enough to permit cold-rolling of thin-gage sheet at room temperature.

What about increasing oxidation resistance also? The approach was to study the effect of alloying elements on the oxidation of columbium.

The more effective elements—titanium, tungsten, and small amounts of aluminum and vanadium—are highly soluble in columbium and have a higher affinity for oxygen than columbium. They, also, formed stable compounds.

Two Systems—Guided by these findings, the Union Carbide Metals research team developed two oxidation-resistant solid-solution systems. One is to yield alloys for nuclear applications. The other is to serve as an alloy base for structural use at high temperatures.

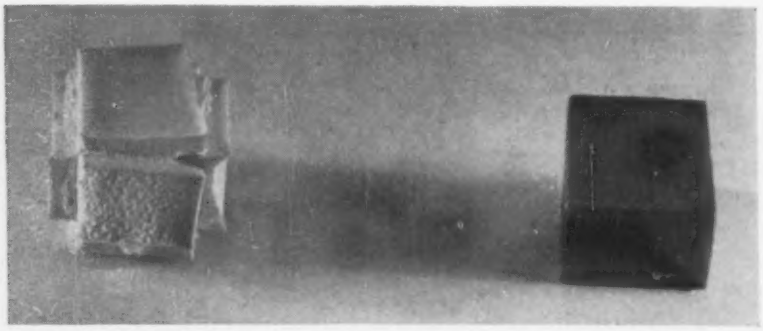
The columbium-aluminum-vanadium alloys such as Cb-22 (94 pct Cb-3 pct Al-3 pct V) and various modifications of this basic composition are strong and resist oxidation below 2000°F. They also resist liquid-metal corrosion enough to show promise for some nuclear uses.

Columbium-titanium-tungsten alloys such as Cb-7 (65 pct Cb-7 pct Ti-28 pct W) and Cb-16 (67 pct Cb-10 pct Ti-20 pct W-3 pct V) have excellent combinations of oxidation resistance and fabricability. For example, Cb-7 at 2500°F has an ultimate tensile strength of 28,300 psi; yield strength of 24,100 psi and elongation at fracture of 53.4 pct.

Compares Properties — The first chart compares the oxidation resistance at 2200 F of Cb-7 and Cb-16 with stainless steel pure columbium, and a simple, columbium-titanium alloy. Cb-16 reveals very high resistance to oxidation contamination and, as the picture shows, even after long exposure at 2000°F.

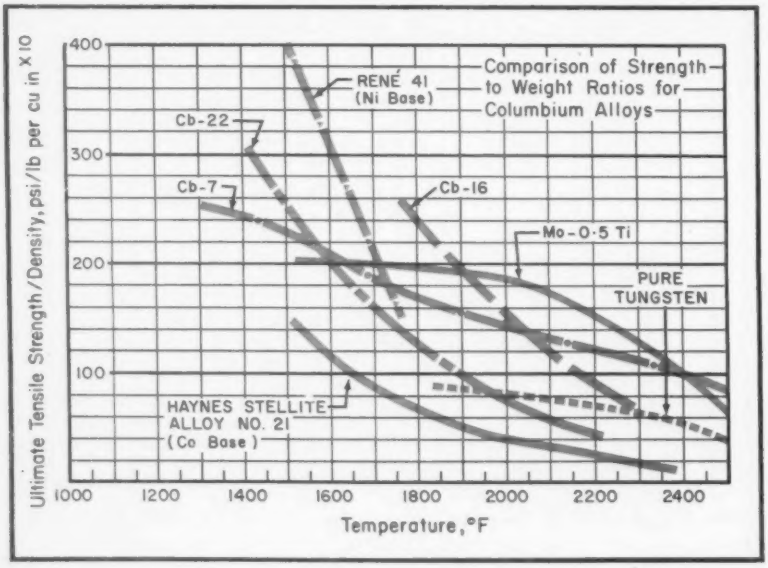
What about mechanical properties? The second chart compares the tensile properties for some of these columbium-base alloys and various other materials on a strength-to-weight basis.

The alloys Cb-7, Cb-16, and Cb-74 are promising steps in Union Carbide Metal's continuing effort to provide better materials. More research remains to be done on columbium alloys, however. Techniques for full-scale commercial fabrication must be evolved. Also the degree of oxidation resistance achieved in fabricable compositions needs improvement to eliminate the need for a coating for long-time service above 2000°F.



PURE METAL DETERIORATES: Tests point up the rapid oxidation of pure columbium metal (left) as compared to the stable Cb-16 alloy (right). Picture was taken after 1 hour exposure to flowing oxygen at 2200°F.

How Tensile Strength Compares



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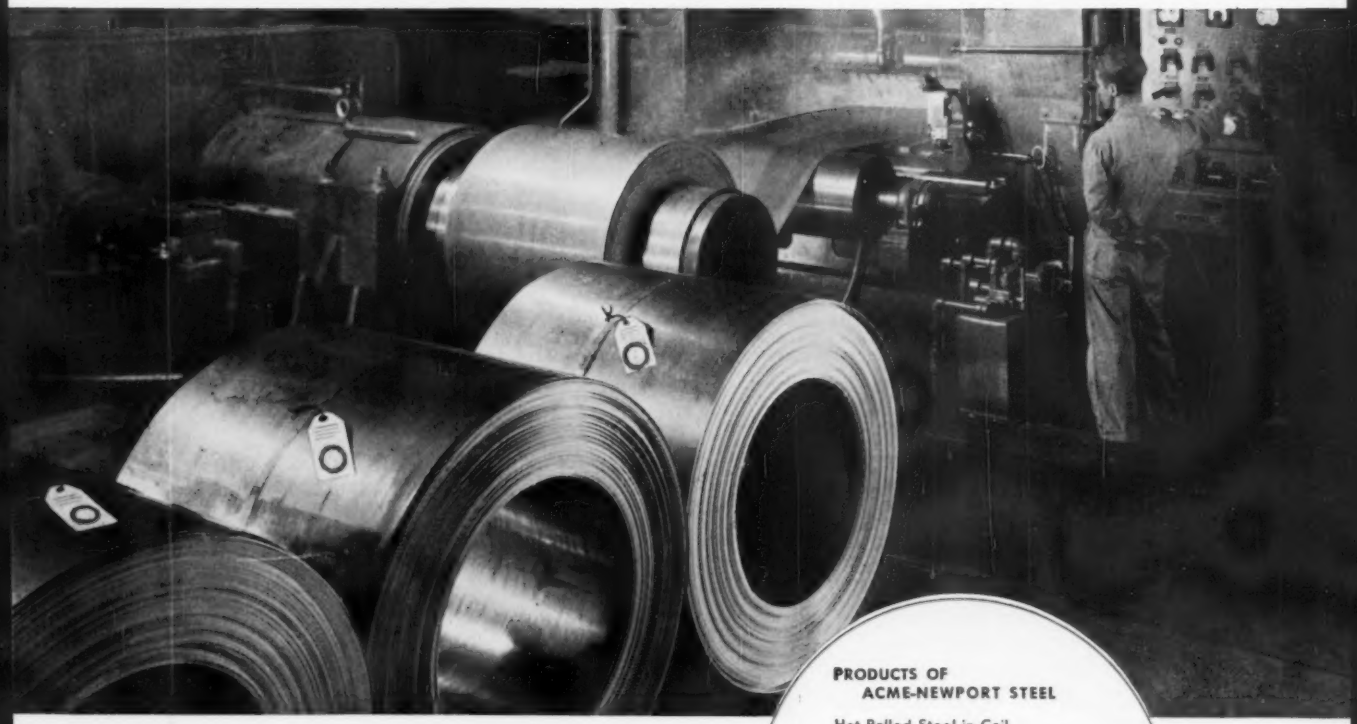

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- Hot Rolled Sheets
- Hot Rolled Pickled Sheets
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- Cold Rolled Sheets
- Alloy Sheets and Plates
- Plates (*3/16" and lighter*)
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- Electric Weld Line Pipe
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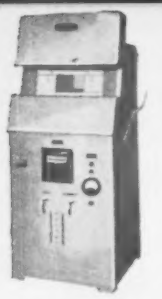
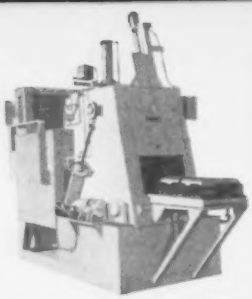
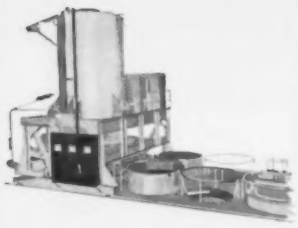


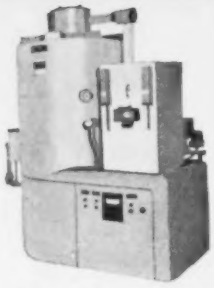
Laboratory Equipment: One-unit box furnace (shown), muffle or for non-oxidizing atmosphere with temperature range to 3000° F.



Automatic Carbonitriding Furnaces: Automated integral quench type (shown) with CORRTHERM electric elements.

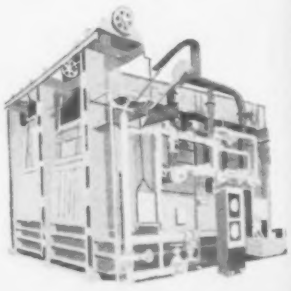


Gantry Type Furnaces: Vertical, controlled-atmosphere, drop bottom, hardening furnace (shown). Complete installation field-installed by Lindberg.

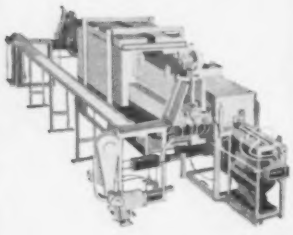


Atmosphere Generators: Hyen generator (shown) for endothermic atmospheres. Generators for all required atmospheres.

Melting and Holding Furnaces: Electric resistance furnace (shown) with capacities of 750 lbs. to 1500 lbs.



Aluminum Reverberatory Furnaces: Twin-chamber melting and holding furnace (shown) with 45,000 lbs. capacity.



Ceramic Kilns: Fully automatic, atmosphere controlled kiln (shown) has 5 control zones for flexibility. Maximum temperature, 2700° F.

Cyclone Tempering Furnaces: Batch type fuel fired tempering furnace (shown). Famous in metal treating industry for years.

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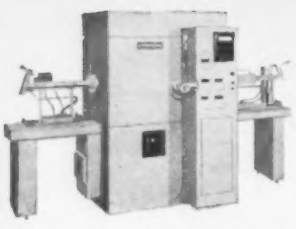
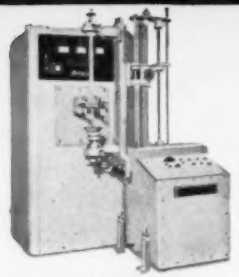
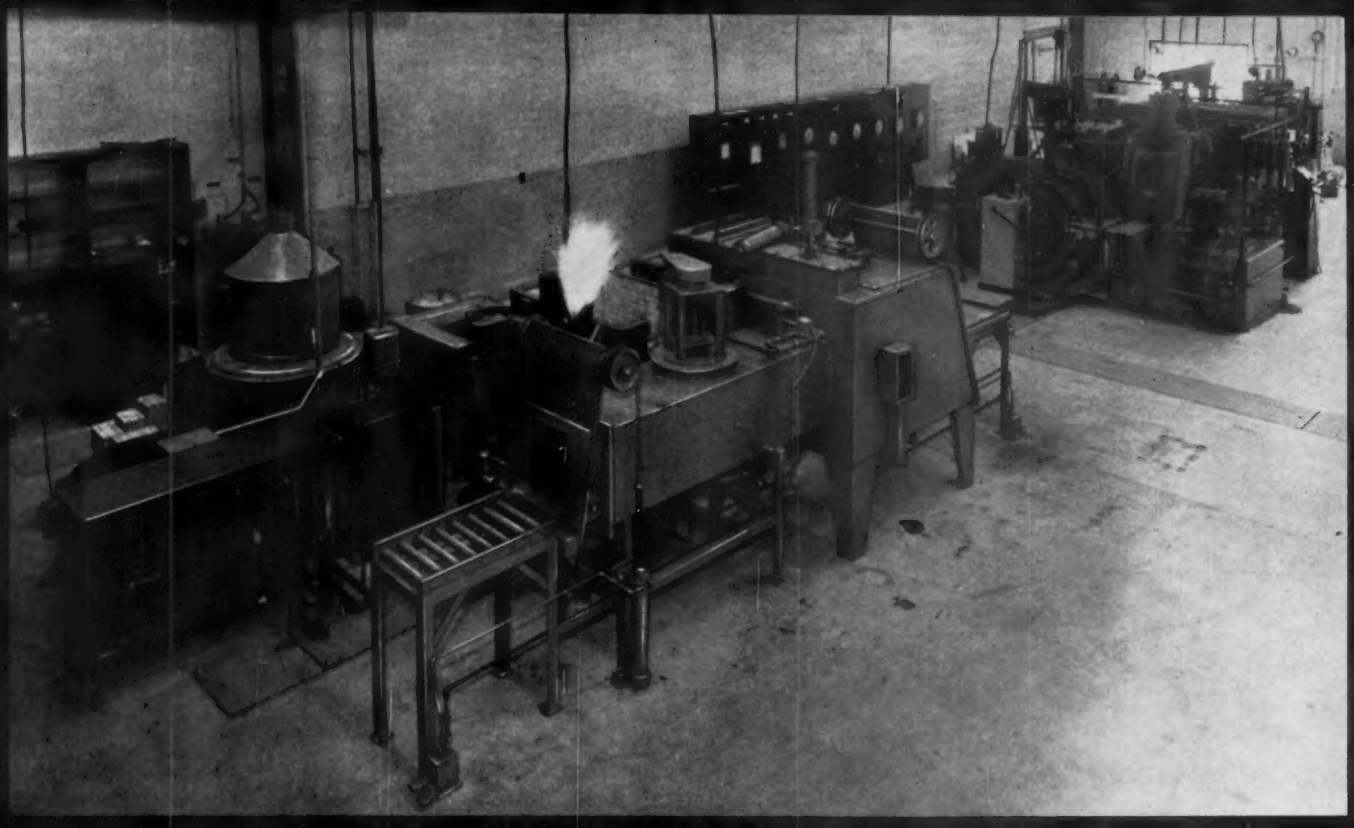


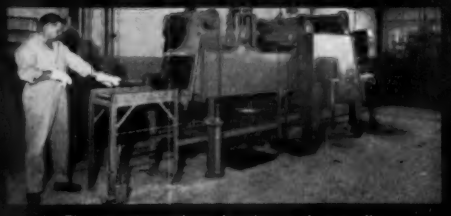
High Temperature Furnaces: New Graphite Tube Furnace (shown) with temperature range 2600° F. to 5000° F. for research and production in metal and ceramic fields.



Induction Heating Units: New Lindberg Floating Zone Scanner for precise production of hyper-pure semi-conductor materials and metals and Induction Heating Unit (shown).



General view of complete Heat Treating Department at new plant of Lear, Inc., Grand Rapids, Michigan. All equipment including furnaces, Hyen atmosphere generator, control panels, oil quench is by Lindberg.



Electric atmosphere brazing and annealing furnace. Hand pusher type . . . 2100° F. maximum temperature.

Electric pit furnace for treatment of high temperature alloys in dry hydrogen atmosphere. Tap transformer also shown.

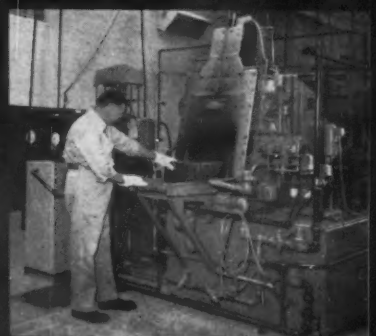
The retort for high temperature pit furnace for treatment of alloys at 2200° F. (left). Production tempering furnace, 22" x 26" work space, shown at right.

Atmosphere tempering furnace, 16" x 24" work space, for both gaseous nitriding and steam treating. One retort in foreground.

LINDBERG Equips Complete Heat Treating Department at Lear, Inc.

The heat treating requirements for the new Grand Rapids plant of Lear, Inc., were put into Lindberg's hands. We supplied them in the way the photographs show. Our engineers cooperated fully with Lear in the selection of the proper Lindberg equipment and the layout of the complete heat treating department. This installation illustrates one of the big advantages of consulting with Lindberg. Our years of experience in all phases of the application of heat to industry, our complete line of all types of industrial heating equipment offer the best assurance that you can coordinate all your needs in one reliable, experienced source. Consult your local Lindberg Field Representative (see classified phone book) or write us direct.

LINDBERG **heat for industry**



Integral quench furnace with CORRTHERM electric heating elements . . . for carbonitriding and general heat treating.

New Equipment and Machinery

Spray Equipment Advances Art of Plastic Tooling

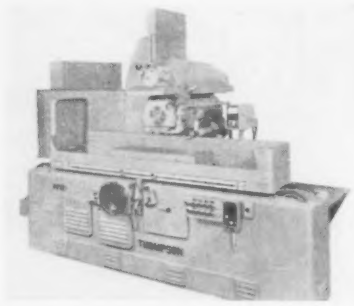
Two new spray guns make possible the combination of spraying resin and fibers in one operation. The resin flow epoxy spray gun sprays premixed polyester or epoxy resin formulations. The other gun is a metal-fiber spray gun which sprays metal-fiber laminates where more conductivity is required. This gun is also used in a new technique whereby inexpensive gypsum cements are fabricated with an epoxy surface coat resin as the working surface. (United States Gypsum Co.)

For more data circle No. 26 on postcard, p. 97

Layout Drilling Machine Has Reduced Setup Time

With numerical control (tape and dial input), a layout drilling machine provides a large degree of flexibility in setting up a wide variety of operations. Provision is made for nine tool changes, with operator having the option of using any speed or feed within the range of the machine. The stops, for depth of rapid traverse and depth of feed, are all directly located in front of the operator. Capacity of the drill is 1 in. in cast iron and ⅞ in. in mild steel. The spindle travel is 7 in.; sliding-arm travel is 10 in. Spindle speeds are infinitely variable within the standard speed range of 225-2700 rpm. (Edlund Machinery Co.)

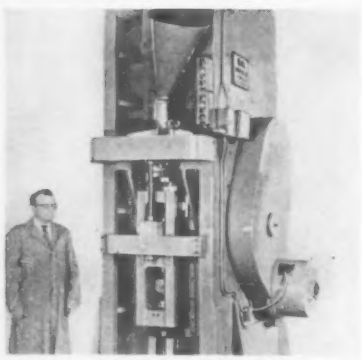
For more data circle No. 27 on postcard, p. 97



Grinder Features In-Built Wheel Head Motor

With complete automatic lubrication, a grinder has a dial-type cross feed with 14 in. of stroke. The grinder also has a 10-hp wheelhead motor on a spindle equipped with self-adjusting block bearings. Both cross slide ways and the ball bearing elevating screw and nut are hardened and ground. The grinder's hydraulic system has a separate hydraulic sealed oil sump which eliminates any oil sump in the base. Controls consist of a rapid traverse feed with lever control for engagement, direction and declutching of the elevation hand wheel. (Thompson Grinder Co.)

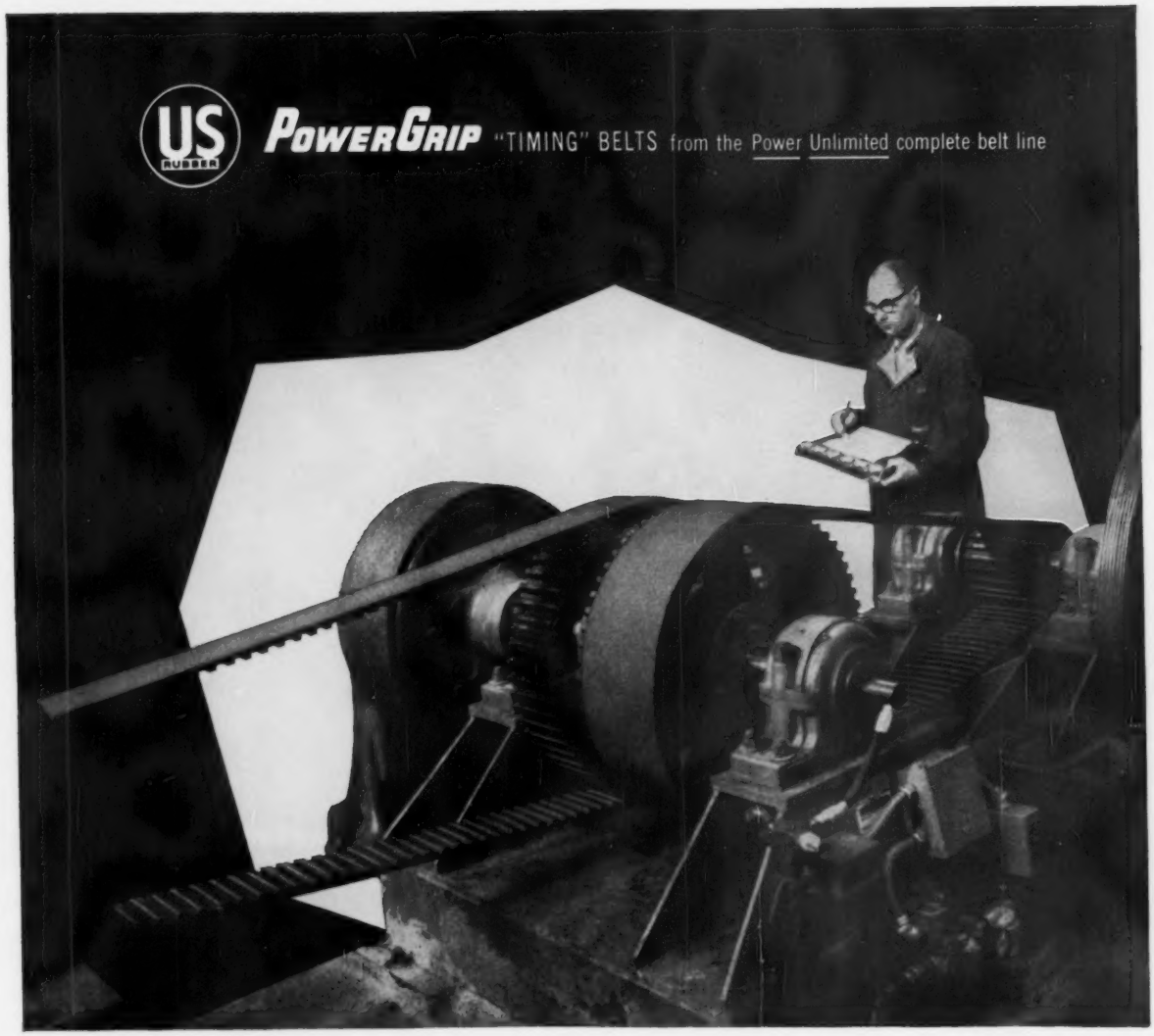
For more data circle No. 28 on postcard, p. 97

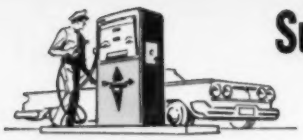


Powder Compacting Press Produces Solid Parts

A mechanical, compacting press automatically and continuously produces solid compacts from dry powdered or granular materials under high pressures. Both upper and lower punches apply a 125-ton compacting pressure. The machine ejects a compact at the full rated pressure. Parts can be produced with depth of material fill up to 6 in., and up to 6-in. diam or length at the rate of 12 per minute. An electrically-operated clutch brake unit allows push-button stop-start control; with inching during tooling setup, and use of either single cycle or continuous operation in production. Some of the many items made on the press are: powdered metal parts, iron cores, tungsten-carbide products. (Kux Machine Co.)

For more data circle No. 29 on postcard, p. 97





Sun Oil Company obtains positive results with U.S. PowerGrip "Timing" Belts

The octane requirements for cars are determined by the Sun Oil Company with scientific accuracy. The octane ratings of motor fuels are in turn determined with precision. Nothing is left to chance. This is why the motorist can pull up at a Sunoco station and obtain the correct octane blend for his car.

All of this predetermination is done on precision equipment whose universal joint drive shaft is connected to a dynamometer by a 1¼" pitch U. S. Rubber PowerGrip "Timing"® Belt. In the words of a company scientist, these belts were selected because they give foolproof, positive drive transmission and do not require lubrication, maintenance or attention. Anything less would interfere with the precision of the testing equipment. This is the experience that has caused innumerable design engineers to specify PowerGrip.

This is the belt that has made possible the development and production of hundreds of appliances and equipment, ranging from sensitive electronic devices, office machinery, household equipment and gigantic production machinery. One way to get expert and instant power and transmission advice is from the U.S Distributor.

US RUBBER

Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

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Coro-Gard® 1706 withstands

BRAND PROTECTIVE COATING

METAL coated with Coro-Gard 1706, right side, shows no effect from salt spray attack. Corroded left side is untreated.

2000-hour corrosion attack

Real corrosion resistance!—That's what you get when you specify new CORO-GARD 1706 Brand Protective Coating.

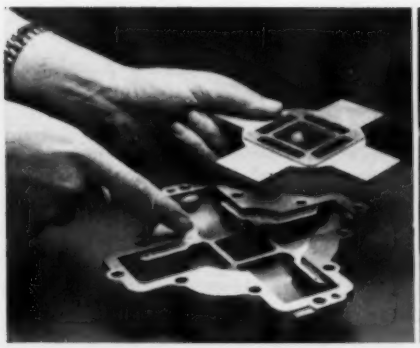
Specify CORO-GARD 1706 Coating for steel, aluminum, wood, concrete, cloth, even some plastics—wherever corrosion or abrasion must be fought. It provides maximum protection at low cost, brushes on as easily as paint. Self-priming, it goes on vertical surfaces with minimum sagging, provides unusually high coverage for economical use.

This neoprene rubber based coating air-cures to a tough, rubbery, protective film with exceptional resistance to corrosive fluids and fumes, water and abrasion. It successfully resisted a 2000-hour salt spray attack, a 20-week submersion in 20% solution of hydrochloric acid, and a six-month weather exposure in Miami, Florida. After all this, CORO-GARD 1706 Coating still maintained its exceptional adhesion and flexibility, its corrosion and abrasion resistance.

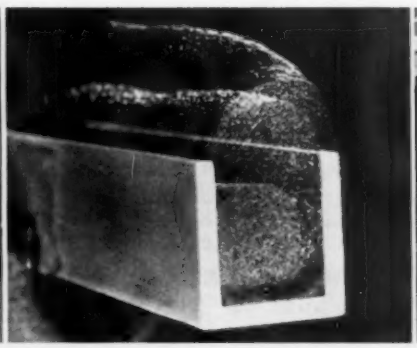
See how CORO-GARD 1706 Coating can help you. For complete information, write today on your company letterhead, specifying area of interest, to: AC&S Division, 3M, Dept. SBQ-70, St. Paul 6, Minn.

"CORO-GARD" is a Reg. T.M. of 3M Co.

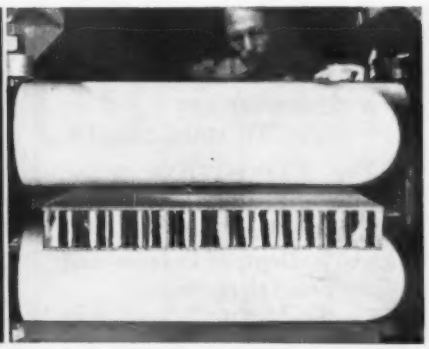
News about other 3M products



SIMPLIFIED PRODUCTION. 3M Adhesive EC-1386 bonds sections of hollow castings. This simplified method of producing complex castings eliminates high rejection rate of sand molding, costly machining, equipment required for mechanical fastening. The adhesive bond fills voids, cures quickly, can be machined for final touch-up.



SURE WAY TO SEAL. 3M Heat Expandable Sealers expand up to 125% under the normal heat of a paint-baking cycle, cure to a tough, flexible mass that keeps out dirt, water and weather, completely seal even the most irregular gap or seam. The unexpanded solid is also efficient as a gasket replacement sealer, flange sealer, and for other sealing jobs.



COLD SANDWICH BONDING. 3M Adhesive EC-1357 makes it possible to bond sandwich panels with a nip roller or cold press. You need no clamps or heated presses to complete tough core-to-skin bonds that resist moisture and high and low temperatures. This one adhesive bonds a variety of materials quickly, economically. Because of its dark color, it absorbs infrared heat quickly, dries fast.

ADHESIVES, COATINGS AND SEALERS DIVISION

MINNESOTA MINING AND MANUFACTURING COMPANY

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3M COMPANY

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- PRIME CONTRACTORS
- SUBCONTRACTORS
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The EXPOSITION is co-sponsored by the twelve Northeast states in cooperation with the U. S. Dept. of Defense and other Federal agencies.

Similar exhibits have had excellent business results for participants.

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FOR DETAILS WRITE:

Lloyd K. Allen, Commissioner
Dept. of Economic Development
State Capitol, Augusta, Maine
(MAyfair 3-4511—Ext. 571)

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 97.

Platform Trucks

Plant conditions and operations, where powered platform trucks can reduce costs, are described in a brochure. Two general phases—material handling and maintenance and service work—are described in detail. (The Prime-Mover Co.)
For free copy circle No. 1 on postcard, p. 97

Quenching Oils

Two new quenching oils are described in a technical bulletin. The bulletin cites typical characteristics of the new oils, and outlines the benefits obtained from their use. Quenching speeds measured by three widely used techniques are reported for each oil. (Sun Oil Co.)
For free copy circle No. 2 on postcard, p. 97

Pneumatic Controllers

Specifications for an indicating pneumatic controller are given in a bulletin. Besides describing the series, models are listed for controlling pressure, vacuum, liquid level, flow, temperature, and humidity. (The Bristol Co.)
For free copy circle No. 3 on postcard, p. 97

Tool-Steel Use

A basic guide to the use of tool and die steels, in space age and other applications, is in booklet form. The booklet describes with numerous charts, graphs and tables the properties of the six main types of tool steel, as classified by American Iron and Steel Institute. A wealth of information is presented on the constitution and hardening of low- and high-alloy steels at both lower and elevated temperatures. (Climax Molybdenum Co.)
For free copy circle No. 4 on postcard, p. 97

Feeders and Valves

Roll and vane-type feeders and rotary valves are described and illustrated in a bulletin. The feeders are designed to handle a large variety of dry pulverized and granular materials. The bulletin lists materials handled by various types of feeders, such as chemicals, powdered metals, cement and coal. (Fuller Co.)
For free copy circle No. 5 on postcard, p. 97

Transformers

Eight-pages in length, a brochure illustrates and describes transformers for resistance welders. Included are photographs of: primary coil winding and insulation, prepared secondary coil, transformer dipping, and several types of completed transformers. (The Taylor Winfield Corp.)
For free copy circle No. 6 on postcard, p. 97

Resin-Coated Sand

For producing shell cores and shell molds, a resin-coated sand is fully described in a colorful brochure. Also reported on are the various mixes available, typical problems solved by using the sand, plant facilities and regional warehouse points. (Aurora Metal Co.)
For free copy circle No. 7 on postcard, p. 97

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Surface Grinder

Information on a surface grinder is contained in a brochure. Fully described are the automatic forced-lubrication system, direct-drive spindle and choice of left or right hand longitudinal feed features—all available as standard equipment. (Harig Mfg. Corp.)

For free copy circle No. 10 on postcard

Scrap Chopper

A technical bulletin describes in detail a complete line of nine scrap choppers. This brochure contains information, specifications, price and ordering procedure on the four automatic scrap choppers, as well as the five powered by the press ram, independent of the die scrap choppers. (Durant Tool Co.)

For free copy circle No. 11 on postcard

Flash-Butt Welders

With photographs of various types and applications, a brochure describes flash-butt welders. Description covers complete tabulation of welding capacities, electrical specifications, mechanical specifications, hand- and air-operated clamping fixtures, welding electrodes, backups and weld upsetting mechanisms. (The Taylor-Winfield Corp.)

For free copy circle No. 12 on postcard

Stainless-Strip Furnace

A four-page bulletin lists features and advantages of a high-production, vertical furnace for continuous bright annealing of stainless-steel strip. The illustrated publication describes the furnace's heating and cooling sections and threading device, heating units, coolers and blowers. A schematic drawing of a typical bright-anneal system is also included. (General Electric Co.)

For free copy circle No. 13 on postcard

Burnishing Tools

Tool sizes and specifications are listed in a bulletin on a line of adjustable roller burnishing tools. The bulletin shows maximum depth of bore, tool dimensions, and construction for tools from 0.375-7.437 in. It also includes information on preparing parts for roller burnishing. (The Gustav Wiedeke Co.)

For free copy circle No. 14 on postcard

Cryogenic Gas Data

Latest data on the physical properties of cryogenic gases comes in both wallet-size and full-sheet size cards. The information supplied includes boiling points, critical points, triple points, specific heats and densities of most gases ranging from Acetylene to Xenon. (Air Products, Inc.)

For free copy circle No. 15 on postcard

Soaking Pits

A 20-page booklet describes electrically-heated soaking pits. Descriptions of the four main types of furnaces, with typical installation and operating data, are included in the four-color booklet. (Rust Furnace Co.)

For free copy circle No. 16 on postcard

Pulse Switch

Two-page data sheet describes an adjustable industrial pulse switch. It is designed for industrial applications in which momentary opening and/or closing of a circuit is necessary. The data sheet includes photographs, dimension drawings, characteristics and pricing information. (Micro Switch)

For free copy circle No. 17 on postcard

Facts on Aluminum

Contained in a 20-page illustrated bulletin are quick facts on aluminum coil, sheet, plate, tubing, pipe, rod and bar available from stock. A guide to selection is included. Aluminum building products are

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **7/28/60**

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FREE LITERATURE

described. Federal specifications, analyses, mechanical properties, tolerances, machinability ratings, finishes, corrosion resistance and relative costs of aluminum alloys complete the data. (Joseph T. Ryerson & Son, Inc)

For free copy circle No. 18 on postcard

Valves

Profusely illustrated, a 20-page bulletin describes 2-, 3- and 4-way electrically-operated valves. This bulletin supplies descriptions, specifications, outstanding features, flow charts, optional features, ordering data and dimensions. (Airmatic Valve, Inc.)

For free copy circle No. 19 on postcard

Processing Equipment

Fully illustrated, a 16-page booklet describes the latest cost-cutting developments in automated processing equipment for handling steel, stainless, brass, and aluminum coils in manufacturing plants and warehouse service centers. (For free copy write on company letterhead to Production Machinery Corp., P.O. Box 104, Mentor, Ohio)

Laboratory Instruments

A 16-page folder describes a convenience-styled line of laboratory and testing instruments. Fully illustrated, it contains specifications, application information and prices of six different portable potentiometers, two dc galvonometers, an ac and a dc null detector, a guarded Wheatstone Bridge Facility, and two electrolytic conductivity indicators. (Leeds & Northrup Co.)

For free copy circle No. 20 on postcard

Removes Contaminants

Presented in a bulletin are precision-built units for removing solid, liquid, or vapor contaminants. These contaminants originate in fluid systems in steel and metal fabrication plants and pneumatic instrument plants. Users of pneumatic instruments and tools, and air separation plants can also make use of this equipment. A cutaway and brief description of each unit defines how contaminants are removed. (Selas Corp. of America)

For free copy circle No. 21 on postcard

Machine-Tool Leasing

A booklet describes in easy-to-understand language a company's leasing arrangement of machine tools. This true lease plan features several advantages, including low-bank-rate finance charges and no security deposits or down payment of any kind. Leases are for five year periods. (The American Tool Works Co.)

For free copy circle No. 22 on postcard

Pre-Finished Metals

Important technical information, for production men seeking methods to streamline factory procedures by using pre-finished metals instead of piece plating, is available in an eight-page discussion report. Effects of various electro-deposits on the fabrication or ductility of sheet and strip steel are described and illustrated. (Apollo Metal Works)

For free copy circle No. 23 on postcard

Detects Flaws

Ultrasonic flaw detection is the subject of a bulletin. The booklet includes operation, techniques, and a complete list of specifications for the flaw detector. The eight-page, illustrated bulletin describes advantages of a new pulse-echo flaw-detector, which has exceptional low-frequency resolving power and penetration. (Branson Instruments, Inc.)

For free copy circle No. 24 on postcard

pH Meter

An illustrated data sheet shows how precise, reproducible readings with ± 0.02 pH accuracy are obtained with a palm-sized pH meter. The meter requires standardization only once a week or less. The technical data sheet also features illustrations showing the pH meter in operation; component parts with their uses. (Sel-Rex Corp.)

For free copy circle No. 25 on postcard

JONES & LAUGHLIN STEEL WAREHOUSE DIVISION

The Department Store of Steel

J & L Steel Service Centers—efficient and dependable. Anywhere you look—from the order department to the shipping floor, from storage to processing equipment like this friction saw—you'll find something new, something better at The Department Store of Steel. Unparalleled expansion, new buildings, the latest machinery and equipment, increased stocks of steel, stainless and aluminum, and skilled warehousemen trained to give *extra* care to every order—all add up to faster, more efficient service for J & L customers.

Take advantage of the streamlined, time-saver service J & L offers. Count on The Department Store of Steel. You'll get exactly what you want—when you want it.

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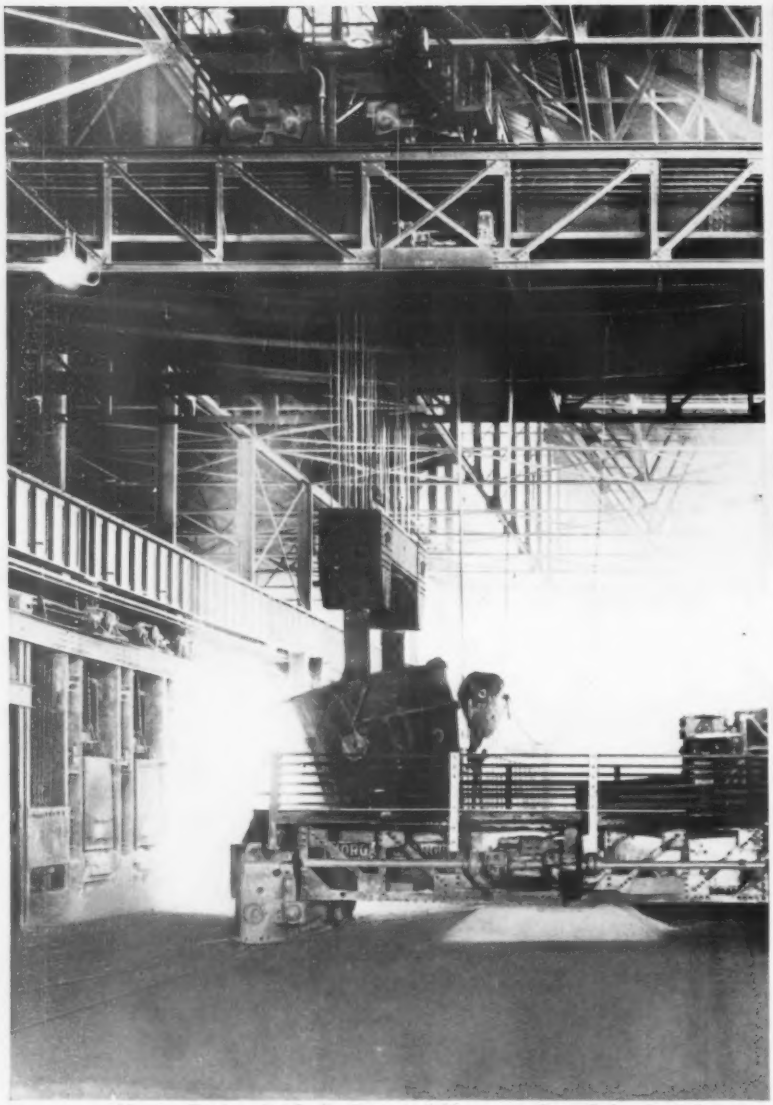

Morgan Engineering Ladle Crane and Charger at Great Lakes Steel Company, Ecorse, Detroit, Michigan

Morgan Teeming Ladle Crane

Morgan Soaking Pit Crane

At Great Lakes Steel...

NEW MORGAN CRANES SUPPLEMENT THE OLD TO BOOST OUTPUT

From scrap to finished steel, Morgan Engineering cranes and chargers keep metal on the move. Having served them faithfully in past years, Morgan equipment was again selected by Great Lakes Steel for their latest expansion program.

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THE
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Overhead electric traveling cranes, gantry cranes, open hearth special cranes, blooming mills, structural mills, shears, saws, auxiliary equipment and welded fabrications.

SALES OFFICES: 1754 North Highland Road, Pittsburgh 28, Pennsylvania
30 Church Street, New York 7, New York

PATENT REVIEW

New Patents In Metalworking

Metal Granules

Method and apparatus for the granulation of metals, R. L. von Reppert (one-half assigned to Paul O. Tobeler, Los Angeles), June 7, 1960. Improved method and apparatus for granulating pig iron or other liquid metals. The molten metal is cooled and granulated in a water spray in a single step. No. 2,939,172.

Electrical Steel

Method for heat treating cube-on-edge silicon steel, H. C. Fiedler and R. H. Pry (assigned to General Electric Co., Schenectady), June 7, 1960. Method for heat treating electrical silicon steel, wherein a small amount of titanium is used to control secondary recrystallization without sulfur being present. No. 2,939,810.

Strip from Powder

Process for making metal strip from metal powder, F. V. Lenel (assigned to American Metal Climax, Inc., New York), May 24, 1960. Method for controlling permeability and other properties during the production of strip from metal powder, e. g. stainless-steel powder. The layer of loose powder to be rolled is formed so as to be relatively thicker towards the edges than in the center. No. 2,937,942.

Cleans Metal Surfaces

Acid baths for cleaning and pickling metal, A. J. Sankaitis (assigned to Amchem Products, Inc., Ambler, Pa.), June 21, 1960. A mineral acid bath cleans and pickles metal surfaces such as mild steel, zinc, etc. The bath contains triphenyl sulfonium chloride as an inhibiting addition agent. No. 2,941,949.

LITHIUM: FLYWEIGHT HERCULES.

10% or more lithium to magnesium and you've got the highest strength-to-weight ratio of any known system.

Add about 1% of lithium to aluminum and you get a new alloy that's 3% lighter, has an 8% higher modulus of expansion, and retains structural strength at 30% higher temperatures than conventional aluminum alloys.

Or you can add minute quantities of lithium, the lightest metal, to lead, one of the heaviest, for a tougher, lighter, harder, stronger alloy with improved founding qualities.

What would happen if you added lithium to your favorite metal? This kind of curiosity has led researchers to publish some three hundred references discussing the resulting alloys with just about every non-ferrous metal mentioned in the periodic table, from arsenic to old zinc.

The references have recently been compiled by Foote, and this definitive bibliography is available to you on request. Write **FOOTE** Mineral Company, 438 Eighteen West Chelten Building, Philadelphia 44, Pa.

If you see a two-headed cow...
call in a *TERATOLOGIST*

(specialist in animal abnormalities)

if your production depends on welding... call in *LINCOLN*

(specialists in arc welding)

AKANSAS implement manufacturer increased his plant production over 30 percent when the Field Engineer from LINCOLN added a Twinarc attachment to his automatic welding installation. With the savings of the first couple of weeks, he bought another Twinarc and further cut costs.

Here's proof that some production problems can be solved without expensive capital equipment purchases. In this case, just a simple attachment did the job—and it was a standard item in the LINCOLN line.

But it takes a working knowledge of the overall production problem to engineer welding applications efficiently. And that's where the LINCOLN Field Engineer comes in. Sure he sells welding—but more than that, he brings manufacturing know-how into your plant and solves his assigned problem without creating a dozen new ones. He's not only an engineer, he's a weldor. He rolls up his sleeves and demonstrates his recommendations. And, as he engineers the application, he relates it carefully to the overall production operation.

That's why we say it's a good idea to do business with LINCOLN where arc welding is a specialty and cost reduction comes to you as a "plus" at no charge.

THE LINCOLN ELECTRIC COMPANY
Dept. 1920 • Cleveland 17, Ohio

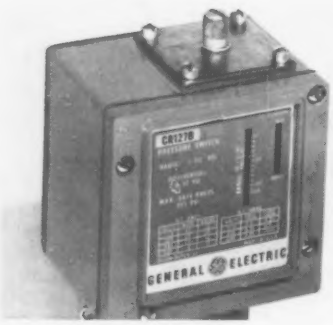
LINCOLN WELDERS

New Materials and Components

Control Valve Incorporates Air-Cooled Solenoids

With a nominal rating of 8 gpm, a four-way directional valve can also handle flows up to 12 gpm without malfunction. The unit offers compactness and versatility for the many directional-control requirements of hydraulic machinery. Solenoid operated, the valve has a maximum recommended operating pressure of 3000 psi. In addition to quiet and cool operation, shock-free performance is insured through superior cushioning. The solenoids are rated for 115-v, 50- or 60-cycle ac service. (Vickers Inc.)

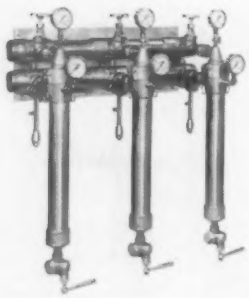
For more data circle No. 30 on postcard, p. 97



Aluminum Die-Cast Cover Encloses Pressure Switch

An industrial pressure-switch line is put to good use for pilot-duty applications on pneumatic and hydraulic systems of process machinery, machine tools, welding equipment; also, for use on pressure lubricating systems. The switch has one normally-open and one normally-closed pilot-duty contact rated 15 amp carry on 110 v; 5 amp on 600 v ac. The bellows-type switch is for ranges up to 300 psi and the piston type for up to 3000 psi. The bellows type is offered in six pressure ranges and operates from air, oil or water pressure. The piston type is for use on hydraulic applications. (General Electric Co.)

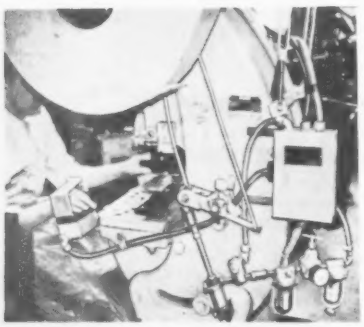
For more data circle No. 31 on postcard, p. 97



Fluid Filters Feature Quick Coupling

Parallel, wall-mounted fluid filters reduce floor space. The line of filters is made for water, oils or chemicals, hot or cold. Their use prevents nozzle plugging, eliminates iron and pipe scale, and clarifies viscous liquids. They protect hydraulic valves and flow meters, and other critical filtering applications. Elements will withstand 150-psi differential pressures without collapse. The filters can be backwashed and blown down "on the run." They are rated 5-350 gpm; 10-700 mesh; pressures to 200 psi; temperatures to 450°F. (Ronningen-Petter Co.)

For more data circle No. 32 on postcard, p. 97



Power-Press Control Serves Dual Purpose

Beneficial to metal stamping and fabricating companies, a press control serves as both a safety control and a means for speeding up production of certain types of metal stampings. The control box automates certain stamping and punching operations. Used as a two-hand control, the circuit is designed so that both palm buttons must be pushed within a pre-determined time. This feature makes it impossible for the operator to tie one palm button down and trip the machine with the remaining palm button, even for the first stroke. The controls come fully wired, reducing setup to a mechanical operation. (Searjeant Metal Products, Inc.)

For more data circle No. 33 on postcard, p. 97

Motor Protector

A miniature circuit breaker protects small motors in portable power tools and appliances. It attaches to the end of the cord within minutes and protects motor from burning out due to overload or overwork. A reset button, instead of fuses, is used to reset the circuit breaker. They are available from 3-10 amp. (Modern Mfg. Co., Inc.)

For more data circle No. 34 on postcard, p. 97

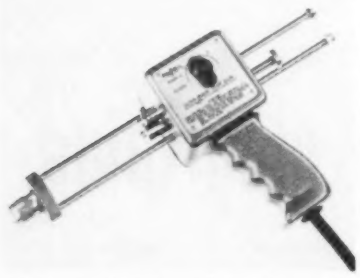
Milling Attachments

Plate-type lathe milling attachments hold large or irregular-shaped work pieces which are difficult to hold in an ordinary vise-type milling attachment. Vertical feed in thousandths is provided on each attachment by means of a micro-screw, and graduated dial. Speed and ease of attachment are distinct advantages of the milling attachment. (Chicago Tool and Engineering Co.)

For more data circle No. 35 on postcard, p. 97

Weld Gun

Automatic time control, incorporated in an arc spot weld gun, insures uniform and consistent welds from one side without back up. No triggers or buttons are used during welding operation. The gun weighs only 2 lb. It welds 14 gage to any

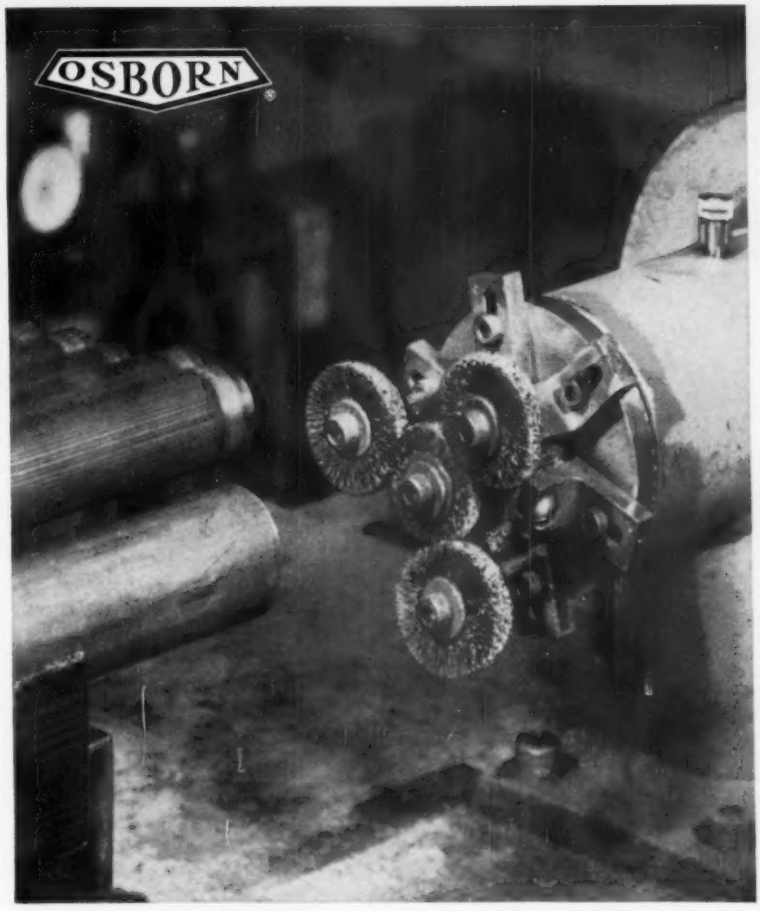


thickness (minimum 2 pieces 26 gage). The gun is a must for duct work, tanks, roofing and general sheet-metal fabrication. It welds mild steel, galvanized and stainless. (Bren Weld Corp.)

For more data circle No. 36 on postcard, p. 97

Measures Speeds

Small and portable, a stroboscopic tachometer measures rotating machine-part speeds. It also ob-



IN THIS SPECIAL POWER BRUSHING SETUP, five Osborn Ringlock® brushes are fixed (do not revolve individually) on a power-driven backing plate. As tubing is guided into the brush cluster, the backing plate rotates the brushes around the tubing end. Inside and outside diameters are wiped clean and cut-off burr is removed.

Tubing gets a quick clean-up

with OSBORN Power Brushing

This important manufacturer of heat transfer equipment had to find a way to clean the ends of long, hard-to-handle tubing after cuttting to length. Both the inside and outside of the tubes required finishing. And the cut-off burrs needed to be removed, too.

A special machine was developed—built around five Osborn Ringlock® power brushes mounted on a power-driven backing plate. While one brush cleans the inside surface, three others clean the outside and the fifth brush removes the cut-off burr. The whole job is quick . . . thorough . . . inexpensive.

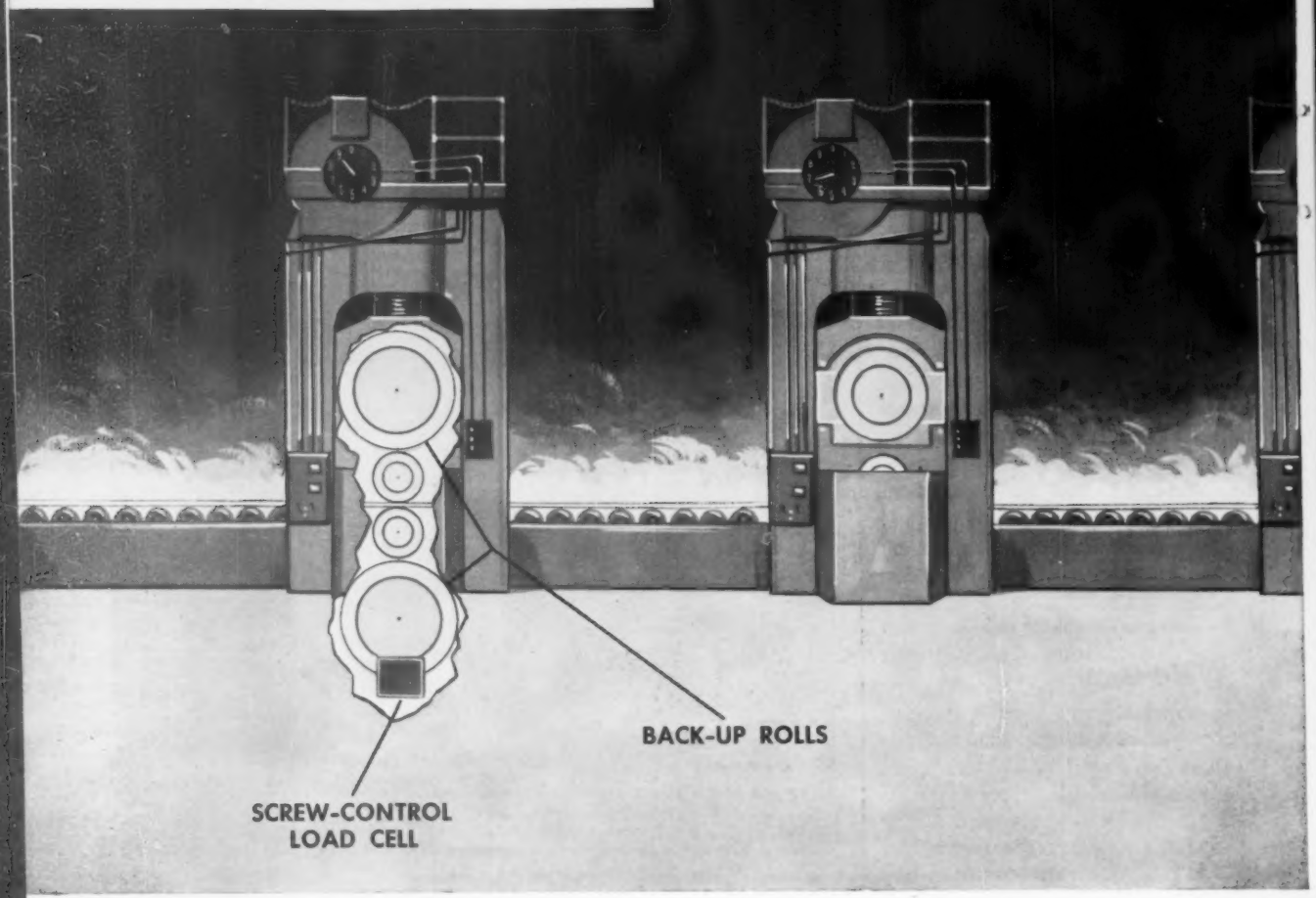
Your metal finishing problems of every description—deburring, cleaning, polishing, precision blending—can be solved with advanced Osborn power brushing methods. An **O**sborn **B**rushing **A**nalysis—made in your plant now—can pinpoint how. No cost or obligation. Write or call *The Osborn Manufacturing Company, Dept. F-99, Cleveland 14, Ohio. Phone ENdicott 1-1900.*

Osborn Brushes

Metal Finishing Machines . . . and Finishing Methods
Power, Paint and Maintenance Brushes • Foundry Production Machinery

FOR QUALITY... PRODUCTIVITY ... PROFIT

METAL ROLLING AUTOMATED BY GENERAL ELECTRIC



AT USS GENEVA WORKS

G-E automatic gage control maintains

A new, vastly improved method of automatically controlling gage on hot-strip mills is available now. Greater strip uniformity and increased yield per ton of steel will result from use of this thickness control system, developed jointly with U. S. Steel Corporation engineers, and now installed at USS's Columbia-Geneva Steel Division, Geneva Works, Provo, Utah.

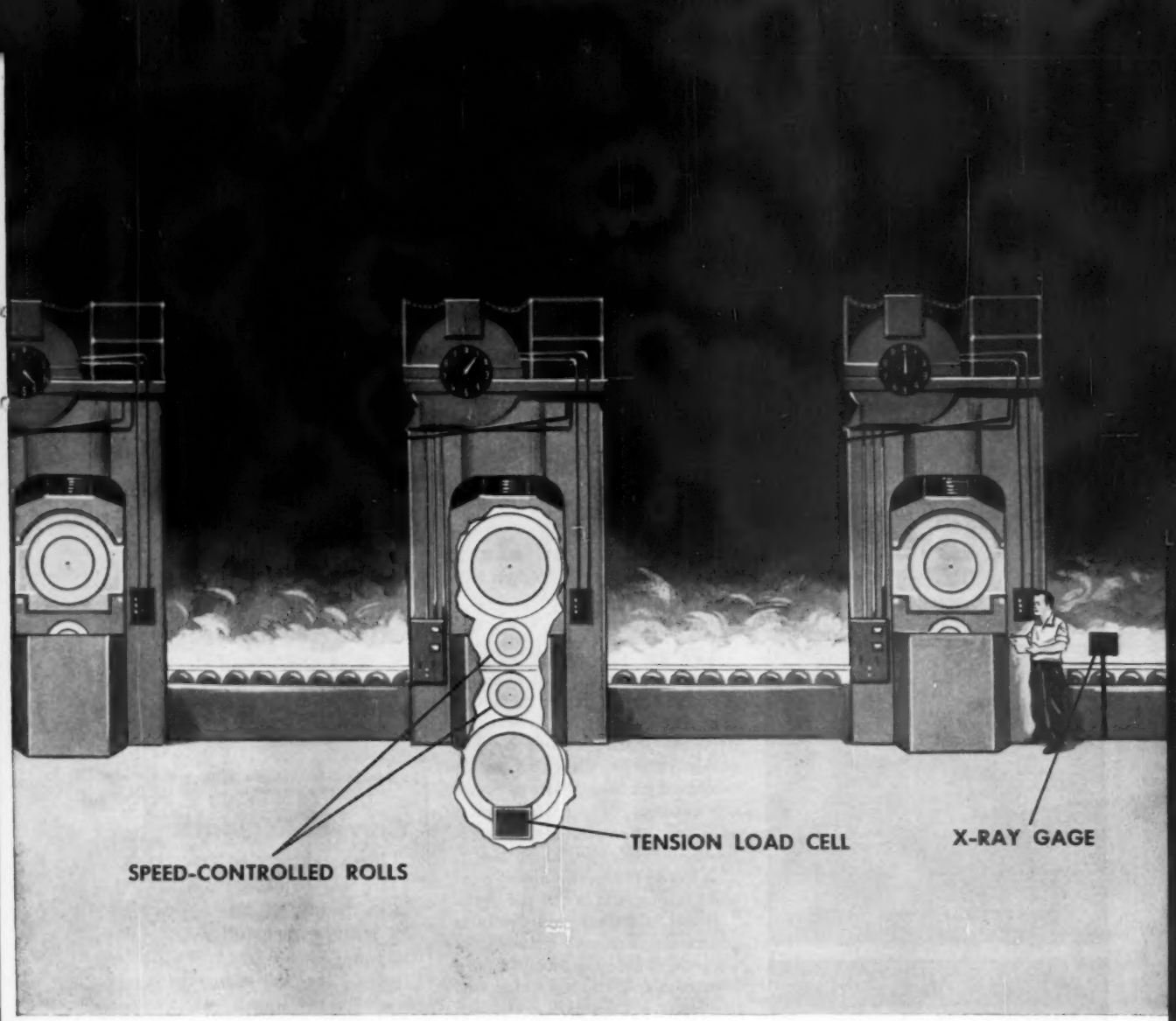
HOW UNIFORMITY AND YIELD ARE CONTROLLED

The system operates on the basis of off-gage steel automatically correcting itself by "triggering" the control to change the roll settings and inter-stand tension. As the temperature or gage of the strip being fed to the mill varies, the pressure against the rolls varies. At the second stand, this change in pressure is detected by the load cell where it is converted into power to move the screwdown motors. This entire operation is completely automatic and is initiated in a fraction of a second.

At the fifth stand, the same detection system is used to recheck the gage of the strip. However, at this point, the correction is made by adjusting the speed of the rolls, rather than their position. This controls the tension of the strip on either side of stand five, depending upon the correction required.

Automatic correction for hot and cold spots—As hot and cold spots pass through the mill, the control "feels" the difference in the hardness of the strip and automatically adjusts inter-stand tension to maintain a constant gage.

Strip "tail" is rolled to gage—The "tail" of the strip is often off-gage as a result of loss of tension as the end of the strip passes through the mill. The gage control



strip uniformity—increases yield

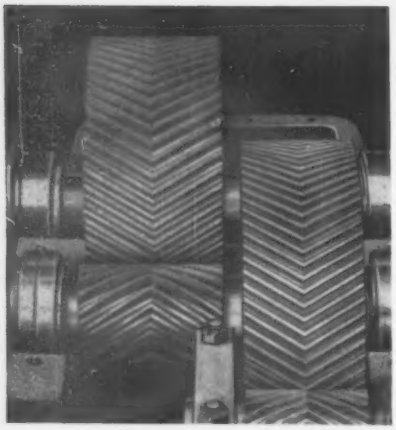
system adjusts the rolls or inter-stand tension to compensate for this loss of tension and rolls the "tail" to closer tolerance thickness, resulting in less scrap and greater yield.

Automatic correction for long-time drift—An x-ray thickness gage is normally used in conjunction with the control. The x-ray continuously measures the gage of the strip, and automatically makes corrections to compensate for thermal effects and mill drift.

For complete details on this new gage control method, contact your G-E Apparatus Sales Engineer today, or write to Section 785–8, General Electric Company, Schenectady, N. Y., for bulletin GEA-6947. Industry Control Department, Salem, Virginia.

Progress Is Our Most Important Product

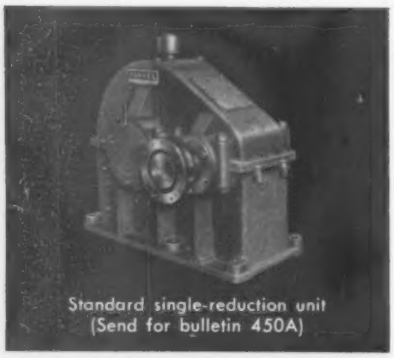
GENERAL ELECTRIC



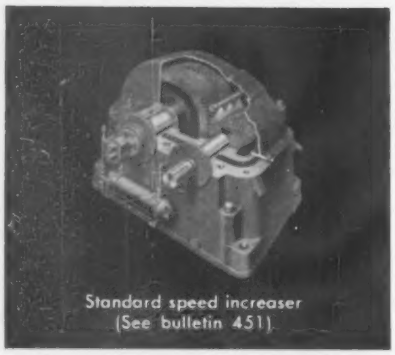
When you come to Farrel for a gear unit you get the benefit of broad selectivity in types, capacities, speeds, and ratios. This enables you to select the unit which meets your needs exactly.

Precision generation...

an extra you get with any Farrel gear unit



Standard single-reduction unit
(Send for bulletin 450A)



Standard speed increaser
(See bulletin 451)

Standard double-reduction unit
(Bulletin 450A)

You get this and more. All gears are precision generated by the well-known Farrel method – a process that results in accuracy of tooth spacing, tooth contour and helix angle. Gears are finish-machined on their shafts to insure concentricity of pitch diameters with axes of rotation; pinions are made integral with their shafts. This initial precision reduces wear and prolongs the life of the gears.

Broad selectivity and precision generation. Remember these twin advantages the next time you need a gear unit. Write today for free literature... then call Farrel for an expert analysis of your gear unit requirements.

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DESIGN DIGEST

serves their operation in slow motion. The new model features a fundamental speed (flashing-rate) range of 110 to 25,000 rpm; also brilliant white-light flashes with extremely-short duration—1 to 6 microseconds—permitting fast action to be "stopped." (General Radio Co.)

For more data circle No. 37 on postcard, p. 97

Temperature Detector

A dual-element, tip-sensitive temperature detector permits measuring the same temperature at two different locations; or permits indication and recording at the same time. Only 5/16 in. in diam, the detector comes in lengths up to 10 ft. It is supplied with a spring-loaded holder to press the tip of the detector against the surface being measured. (Thomas A. Edison Industries)

For more data circle No. 38 on postcard, p. 97

Current Regulator

For resistance-welding control, a current regulator insures better weld quality. It accomplishes this by compensating for all three factors that might change the welding current. It employs an instrument-type current transformer to sense current in the primary of the welding transformer. The device comes as a plug-in unit for any welding equipment that has phase-shift heat control. (General Electric Co.)

For more data circle No. 39 on postcard, p. 97

Gun-Drill Attachment

For accurate, high-speed gun drilling on turret lathes, a gun-drill attachment fits No. 5 or larger ram-type turret lathes. An adapter is not needed. With an adapter, however, the unit fits saddle-type lathes. The gun driller is driven by a 1½-hp motor and offers a choice of four spindle speeds, 1748, 2450, 3345 and 4600 rpm. The gun driller mounts right on the turret face, guaranteeing rigidity at all times, even when indexing. (The Ward-Riddle Co.)

For more data circle No. 40 on postcard, p. 97

The Iron Age Summary

Autos: How Much? How Soon?

Automakers and their suppliers have started placing steel orders for September.

But plus factors are balanced by negative ones. And there's little hope held for August.

■ Autos hold the key to any major upswing in steel production. And the steel industry has been anxiously waiting for a clue to the automakers' plans.

The auto industry has at last started ordering steel. But the orders aren't as informative as the steelmakers would like. They have both positive and negative characteristics.

On the Plus Side—Orders are coming from all quarters. Medium- and small-size supplier companies as well as the automakers are placing orders. Many of these had bought little or nothing in recent months. Their placing of steel orders indicates they are receiving releases from the auto companies for new model production.

All product lines are represented —hot- and cold-rolled sheet and strip, carbon and alloy bars, and stainless steel. The product mix follows traditional patterns.

Buyers are ordering on the basis of normal 45-day lead times. This indicates the orders aren't inventory hole-fillers. Users are asking to get on first mill schedules for various products. And some companies, notably parts suppliers, are placing orders for October and November.

Negative Factors — Automotive orders are coming in a month later than expected. Orders call for delivery in September, indicating no earlier than October automobile production.

Except for rush orders, mills will still be flat on their faces in August. They're trying to borrow from September production, asking users to take delivery of steel in August. Rate of incoming orders for August is such that some mills are hard pressed to keep equipment running until they can "bunch" orders.

Ordering still seems to be concentrated in the Detroit area. There's been no significant change in automotive orders in other districts.

Lack of Support — Other large steel users are failing to support the market. Appliances hold some promise for fall orders, but a large finished-goods inventory leaves the timing doubtful. Farm implement makers are holding off. Railroad buying has all but ceased to be a factor in the market. Oil and gas industries are weak. Home building lags. And warehouses are trying to get out from under inventories.

Consequently, the improvement showing up in automotive steel orders still must be considered relative. By themselves they're not enough to carry the industry. Rate of incoming orders hasn't been enough to change August delivery time significantly. In the East, delivery times have actually shortened for some products.

There's even a possibility that continued low order intake for next month could actually cause an extension of lead times if some mills are forced to shutdown or further reduce operations.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week 1,533	Last Week 1,550	Month Ago 1,510	Year Ago 345
Ingot Index (1947-1949=100)	95.4	96.5	94.0	21.5
Operating Rates				
North East Coast	61.0	60.0*	58.0	15.0†
Buffalo	55.0	56.0*	60.0	0.0†
Pittsburgh	51.0	48.0	46.0	26.0†
Youngstown	48.0	45.0*	40.0	10.0†
Cleveland	28.0	48.0*	57.0	0.0†
Detroit	80.0	86.0*	82.0	24.0†
Chicago	59.0	57.0*	52.0	5.0†
Cincinnati	48.0	47.0*	47.0	59.0†
St. Louis	44.0	50.0	60.0	68.0†
South	60.0	64.0*	56.0	12.0†
West	53.0	53.0*	62.0	0.0†
U. S. Rate	53.8	54.4	53.0	12.2

*Revised †IRON AGE Estimate
Source: American Iron And Steel Institute

Prices At a Glance

(Cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.41	$66.41	$66.41	$66.41
Scrap No. 1 hvy (Gross ton)	$31.50	$31.50	$31.00	$39.50
No. 2 bundles	$21.17	$21.17	$20.83	$27.00
Nonferrous				
Aluminum ingot	28.10	28.10	28.10	26.80
Copper, electrolytic	33.00	33.00	33.00	30.00
Lead, St. Louis	11.80	11.80	11.80	11.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	104.375	103.50	101.75	101.75
Zinc, E. St. Louis	13.00	13.00	13.00	11.00

Lowered Inventory Cuts Costs

Lowering inventory for all materials helped reduce costs for the Columbia Gas System.

John Hagerty, director of purchasing, used standardization in his department to achieve this.

■ Columbia Gas System, a major natural gas utility with annual revenues close to a half-billion dollars, had traditionally maintained an inventory of over $20 million in equipment and materials.

Someone did a little calculating and found it was costing the company about 12 pct of their value to maintain these stocks. The company wanted to cut costs, and decided the most direct way was to devise a method to slice inventories.

Let's Try It—"People here had been talking about standardizing purchasing for years," says John Hagerty, director of purchasing. "We finally decided to try it. That was four years ago.

"Now our inventory ranges from about $12 million low in the winter to a high of about $18 to $19 million. It still costs us about 12 pct to maintain. But at that rate we are saving over $500,000 per year."

Top Brands—How did Columbia standardize purchasing? Says Mr. Hagerty: "We decided which were the best brands in each category of materials and equipment and eliminated the rest."

Columbia now has its material and equipment divided into about 30 categories such as filler metal for welding, corrosion prevention materials, plug valves, service regulators.

The company hired a materials engineer and materials coordinator. These men worked with a standards committee of top executives, and a number of sub-committees to set up the list of standard items.

In service regulators, for instance, Columbia formerly stocked over 20 kinds. Now they stock just nine.

Specific List—A list of the nine standards is given to each of the four local purchasing agents of the company, and all the storekeepers. They must specify and order from this list.

The standard system makes it easier for Mr. Hagerty to keep an accurate, up-to-date list of stocks at all plants. In emergencies, or for economy, he can easily transfer parts and equipment.

While the local purchasing agent can buy a standard item from any supplier, Columbia usually buys in such volume it deals directly with manufacturers. The smaller list gives Columbia a closer relationship with these suppliers which results in such advantages as quantity discounts and quicker deliveries.

Live Competition — In each of the 30 categories (there will be 60 when the project is completed) there are at least five suppliers. This keeps the competitive factor in the picture.

Mr. Hagerty admits the system might restrict him from taking advantage of a special situation that might develop in a market. But he points out that the list is far from closed.

JOHN HAGERTY: Standardization in buying cuts costs.

Stainless Pricing

A new concept in the pricing of specialty stainless strip has been announced by Ulbrich Stainless Steel, Inc., Wallingford, Conn.

New price schedules divide items into standard and non-standard categories. Quantity schedules reflect these divisions.

Buyers of small quantity orders (up to 9 lb) pay a net service charge. Beyond these quantities, service charges are reduced.

STRAPS SIZZLING COILS BY REMOTE CONTROL!

Acme Idea Man William Whyte helped develop Idea No. U8-1, at Dominion Foundries and Steel, Ltd., Hamilton, Ont.

One of Canada's leading basic steel producers keeps in step with increased coil-making capacity with a first-of-its-kind tying method engineered by Acme Steel—the F5 Strapping Machine.

This new innovation is customized into a push-button automatic, remote controlled strapping station. It ties 5 to 14 ton hot coils in 12 seconds! Operation is simple and safe. Strapping is applied, tightened to uniform tension, sealed and cut—all by one push-button.

We've prepared a colorful 12-minute sound film of this entire operation for group showing. For arrangements, write on your letterhead to Acme Steel.

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Acme Steel Products Division
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Please send me Idea No. U8-1 and examples of how major companies in my field use Acme Steel Strapping.

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When Will Delivery Stretchout Come?

Mill shipping promises have contracted about as far as they can.

But deciding when, and if, they will start to lengthen is difficult.

■ When will mill deliveries start to lengthen?

With the market still in the doldrums, the timing is uncertain. In a few scattered cases, (see table below), some shipping estimates are still being pared. Examples are sheet, strip, and bar at Pittsburgh; cold-rolled sheet strip, and heavy plate along the East Coast. All these are down a week or more.

On the encouraging side is the pickup in orders from auto suppliers for September delivery. (See Summary, p. 109). But the situation is confused among other steel buyers.

Summer Gap — In some cases, customers are placing rush orders for July delivery. But with a few fourth quarter orders already received by mills, August and September order books are still wide open.

Deciding when — and if — the market will tighten is difficult. Some wire mills are warning customers to stock up now. While no signs of a pickup are yet present, the mills claim a sudden surge could lengthen deliveries by late August or early September.

Typical of the uncertainty is the position of steel service center purchasing agents. Some warehouse officials want tight inventory control continued. But warehouse purchasers, speculating about a sales pickup, want to enlarge stocks.

Sheet and Strip — Automakers are placing orders for September delivery. But this is too late to help mill order books for August. As a result, August orders for many will be slightly better than July, but about on a par with June. Some **Chicago** area producers have only about 50 pct of August tonnage booked. Strip mills there are operating on only 10 to 12 turns a week.

Cleveland mills are being helped by sheet orders from European automakers. They expect an upturn in domestic sales by mid-September. Along the **East Coast,** delivery promises on cold-rolled sheet and strip have shortened another week. And if mills have hot bands available they can ship even faster than the official 2 to 5 week promises.

Plates and Shapes—This market remains slow. August orders are not showing the strength some mills expected. Sales are flat except in isolated instances. Some linepipe orders are helping Chicago area plate mills. Mills further east at **Pittsburgh** report very little improvement in August orders over July. **East Coast** producers described sales as slow, new orders slim, and deliveries rapid.

Bar — Bar mill products are among the slowest of steel items. In most areas, cold-finished bars are available right out of stock. With fast delivery available, hot-rolled bar customers are placing orders only a week or two before shipment is needed.

Wire Products — Sales of construction wire products are better, reflecting improvement in contract awards. Manufacturers wire is also showing more life. Orders for one **Pittsburgh** mill are 30 pct better than the mill estimated. Some **Midwest** wire mills are urging buyers to stock up now. They are warning deliveries might lengthen suddenly.

Pipe and Tubing—Standard pipe orders are rebounding slightly. Jobbers are starting to do a little more buying, apparently expecting a seasonal upturn this fall. Oil country goods are a little more active. Some oil producers are placing a few forward orders, **Pittsburgh** mills report.

Delivery Promises at a Glance

	East	Pittsburgh	Cleveland	Detroit	Chicago	West Coast
CR Carbon Sheet	2–5 wks	2–4 wks	3–5 wks	4–6 wks	1–3 wks	4–5 wks
HR Carbon Sheet	2–4 wks	2–4 wks	2–4 wks	2–4 wks	1–2 wks	4 wks
CR Carbon Strip	2–5 wks	3–5 wks	3–5 wks	4–6 wks	1–3 wks	4–5 wks
HR Carbon Strip	2–4 wks	2–4 wks	2–4 wks	2–4 wks	1–2 wks	4 wks
HR Carbon Bars	2–4 wks	1–3 wks	2–4 wks	1–4 wks	Stock–2 wks	4 wks
CF Carbon Bars	2–4 wks	1–3 wks	2–3 wks	Stock–6 wks	Stock–4 wks	1–2 wks
Heavy Plate	2–3 wks	1–2 wks			1–3 wks	4 wks
Light Plate	2–3 wks	1–2 wks	2–4 wks		1–2 wks	4 wks
Merchant Wire	Stock	Stock	1–3 wks		Stock	2 wks
Oil Country Goods	Stock	Stock	Stock		Stock	
Linepipe	Stock	1–4 wks	Stock		4–8 wks	4–8 wks
Buttweld Pipe	Stock	Stock	2–4 wks	Stock	Stock–2 wks	Stock
Std. Structurals	2–4 wks	1–2 wks	3–5 wks	1–6 wks	1–3 wks	2–4 wks
CR Stainless Sheet	Stock–4 wks	Stock–3 wks	Stock–6 wks	Stock–6 wks		
CR Stainless Strip	Stock–4 wks	Stock–3 wks	Stock–6 wks	Stock–6 wks		

COMPARISON OF PRICES

(Effective July 26, 1960)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	July 26 1960	July 19 1960	June 28 1960	July 28 1959
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	14.10	14.10	14.10	13.55
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchants bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	45.00
Wrought iron bars	14.90	14.90	14.90	14.90
Wires: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 100 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

	July 26 1960	July 19 1960	June 28 1960	July 28 1959
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.57	$70.57	$70.57	$70.57
Foundry, South Cin'ti	73.87	73.87	73.87	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.07
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb‡	11.00	11.00	11.00	12.25
Pig Iron Composite: (per gross ton)				
Pig iron	$66.41	$66.41	$66.41	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$30.50	$30.50	$30.50	$43.50
No. 1 steel, Phila. area	33.50	33.50	33.50	39.50
No. 1 steel, Chicago	30.50	30.50	29.00	35.50
No. 1 bundles, Detroit	27.50	27.50	27.50	37.50
Low phos., Youngstown	34.50	34.50	33.50	44.50
No. 1 mach'y cast, Pittsburgh	48.50	48.50	49.50	52.50
No. 1 mach'y cast, Phila.	49.50	49.50	51.50	50.50
No. 1 mach'y cast, Chicago	45.50	45.50	45.50	59.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$31.50	$31.50	$31.00	$39.50
No. 2 bundles	21.17	21.17	20.83	27.00
Coke, Connelsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	14.75-15.50	14.75-15.50	14.50-15.50
Foundry coke, prompt	18.50	18.50	18.50	18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	33.00	33.00	33.00	30.00
Copper, Lake, Conn.	33.00	33.00	33.00	30.00
Tin, Straits, N. Y.	104.375	103.50	101.75	101.75
Zinc, East St. Louis	13.00	13.00	13.00	11.00
Lead, St. Louis	11.80	11.80	11.80	11.80
Aluminum, virgin ingot	28.10	28.10	28.10	26.80
Nickle, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composites

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PUZZLED . . .

about personnel problems

Dissatisfied with present recruiting methods? The IRON AGE Employment Exchange is the meeting place for employers and men qualified in all phases of metalworking. For advertising rates, write to Chestnut and 56th Sts., Philadelphia 39.

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QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866

THE WHELAND COMPANY

CHATTANOOGA 2, TENN.

Dealers Call July The Low Point

Most dealers believe the low point in the market has been reached in July.

But August is expected to bring only a sideways price movement—or a slight increase, at best.

■ The slight upswing reported last week is now looked upon as sort of a "flash in the pan." The scrap market is still dead with no sign of life in sight.

July is considered by most dealers as the low point of the year. And prospects for August don't hint at any major price increases. The exporting that has sustained the market during the lull should continue.

End of Lull?—Cleveland dealers feel the lull is nearing an end. Also, in Pittsburgh there is speculation that August may bring some higher prices. Dealers in the South, especially Birmingham, however, say buying is so bad there really isn't a market. Philadelphia dealers are far from optimistic—though hopeful.

All in all, it's a quiet scrap market this week with no real optimism inspired by August prospects.

Pittsburgh—A tightening of supply continues to create price firmness in this market. There is no increase in demand and consumers are not willing to pay higher prices. However, it is becoming more difficult to meet the existing demand at current prices. Offers of distress scrap have stopped locally. The lightness of industrial offerings is expected to produce prices that are at least equal to last month's and probably higher.

Chicago—Major mills again held buying to a minimum. But the scrap market continued to tighten through last week. Railroad lists increased in price somewhat, though some mills were able to buy small lots at unchanged prices. Foundry grades are stiffer, despite slow foundry operations. Some speculation suggests a sharp increase in factory bundle prices. Dealer prices are up.

Philadelphia—The general market has been summed up as "status quo . . . still dead." The same old story reveals practically no domestic business with a lack of sales at the quoted prices. There are some purchases for export in August. But these are at the existing prices. Dealers are in general agreement that exports will be maintaining the market until at least September.

New York—Cast grades continue to be the only items moving in the domestic market. But steelmaking grades are moving well for export. There is no change in prices or the general tone of this market.

Detroit—Brokers and dealers believe July was the low point in the market. They do not look for August prices to drop. There is some feeling that industrial lists may bring rises over last month. With model changeovers in effect at some plants, August scrap output is expected to drop around 25 pct below July.

Cleveland—Dealers are a little more bullish this week. This is mostly because they feel the lull should end soon. Movement is very slow here and in the Valley. Auto lists this week will again more than satisfy the market. Speculation will probably hold the prices up.

St. Louis — A firm undertone continues to exist in this scrap market. Apparently, dealers are not too anxious to sell. Despite the firm tone, some railroad grades showed a little easier trend. Trading has been on the quiet side.

Cincinnati—The market is at a dead standstill with only moderate buying programs expected for August. The foundry market was hard hit by vacations on top of slow business.

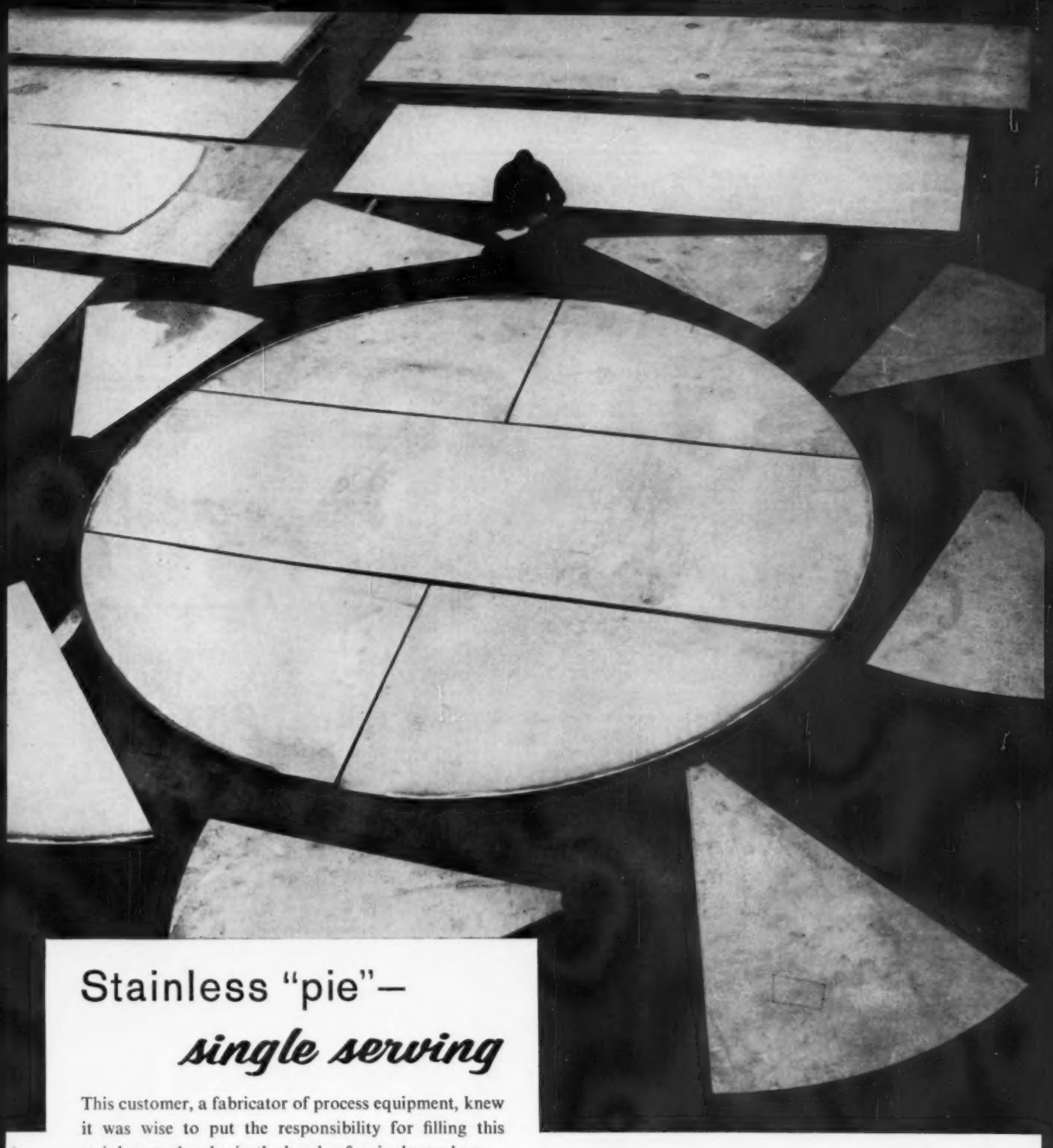
Birmingham—Scrap prices seem to have leveled off in this district except for cast. Brokers say there is not enough buying to establish a market and some of the more pessimistic predict there may be further cuts in some grades. No. 1 cupola cast and stove plate moved well this week, but were cut $1 per ton by purchasers. The export market continues active.

Buffalo—There were a few minor price changes this week, but the general market here remained quiet and stable. The August outlook calls for fair to weak domestic action.

Boston — The export market is somewhat better. Prices are holding firm, however there is very little domestic business.

West Coast—Hardly anyone in the scrap market expects price changes during August. Some dealers think it will be September before any changes come. If it weren't for exporting, many dealers say they could take a long holiday.

Houston—The market continues to be quiet with little activity reported. Intake is slow due to rainy weather and depressed prices. One exporter reports difficulty in getting scrap.



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SCRAP PRICES *(Effective July 26, 1960)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	31.00 to 32.00
No. 1 factory bundles	35.00 to 36.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	30.00 to 31.00
Machine shop turn.	13.00 to 14.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	17.00 to 18.00
Low phos. punch'gs plate	37.00 to 38.00
Heavy turnings	27.00 to 28.00
No. 1 RR hvy. melting	36.00 to 37.00
Scrap rails, random lgth.	46.00 to 47.00
Rails 2 ft and under	50.00 to 51.00
RR specialties	49.00 to 50.00
No. 1 machinery cast.	47.00 to 48.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	37.00 to 38.00
Stainless	
18-8 bundles and solids	185.00 to 190.00
18-8 turnings	85.00 to 90.00
430 bundles and solids	90.00 to 95.00
410 turnings	60.00 to 65.00

Chicago

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	31.00 to 32.00
No. 1 factory bundles	35.50 to 36.50
No. 2 bundles	19.00 to 20.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	14.00 to 15.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Low phos. forge crops	41.00 to 42.00
Low phos. punch'gs plate, ¼ in. and heavier	36.00 to 37.00
Low phos. 2 ft. and under	34.00 to 35.00
No. 1 RR hvy. melting	34.00 to 35.00
Scrap rails, random lgth.	42.00 to 43.00
Rerolling rails	52.00 to 53.00
Rails 2 ft. and under	47.00 to 48.00
Angles and splice bars	42.00 to 43.00
RR steel car axles	48.00 to 50.00
RR couplers and knuckles	39.00 to 40.00
No. 1 machinery cast.	46.00 to 47.00
Cupola cast.	41.00 to 42.00
Cast iron wheels	32.00 to 33.00
Malleable	45.00 to 46.00
Stove plate	34.00 to 36.00
Steel car wheels	37.00 to 38.00
Stainless	
18-8 bundles and solids	175.00 to 180.00
18-8 turnings	85.00 to 90.00
430 bundles and solids	85.00 to 90.00
430 turnings	40.00 to 50.00

Philadelphia Area

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	14.00 to 15.00
Mixed bor. short turn.	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Shoveling turnings	20.00 to 21.00
Clean cast. chem. borings	23.00 to 24.00
Low phos. 5 ft and under	37.00 to 38.00
Low phos. 2 ft punch'gs	39.00 to 40.00
Elec. furnace bundles	36.00 to 37.00
Heavy turnings	27.00 to 28.00
RR specialties	39.00 to 40.00
Rails, 18 in. and under	53.00 to 54.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	37.00 to 38.00
Cast iron car wheels	40.00 to 41.00
Malleable	45.00 to 46.00
No. 1 machinery cast	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$26.50 to $27.50
No. 2 hvy. melting	22.50 to 23.50
No. 1 dealer bundles	26.50 to 27.50
No. 2 bundles	17.50 to 18.50
Machine shop turn.	10.00 to 11.00
Shoveling turnings	12.00 to 13.00
Cast iron borings	12.00 to 13.00
Low phos. 18 in. and under	33.00 to 34.00
Rails, random length	41.00 to 42.00
Rails, 18 in. and under	49.00 to 50.00
No. 1 cupola cast.	35.00 to 36.00
Hvy. breakable cast.	32.00 to 33.00
Drop broken cast.	47.00 to 48.00

Youngstown

No. 1 hvy. melting	$33.00 to 34.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	21.00 to 22.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	19.00 to 20.00
Low phos. plate	34.00 to 35.00

Cleveland

No. 1 hvy. melting	$29.50 to $30.50
No. 2 hvy. melting	22.00 to 23.00
No. 1 dealer bundles	29.50 to 30.50
No. 1 factory bundles	33.00 to 34.00
No. 2 bundles	18.00 to 19.00
No. 1 busheling	29.50 to 30.50
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Cut structural & plates, 2 ft. & under	37.00 to 38.00
Drop forge flashings	29.50 to 30.50
Low phos. punch'gs plate	30.50 to 31.50
Foundry steel, 2 ft. & under	33.00 to 34.00
No. 1 RR hvy. melting	34.00 to 35.00
Rails 2 ft. and under	49.00 to 50.00
Rails 18 in. and under	50.00 to 51.00
Steel axle turnings	24.00 to 25.00
Railroad cast.	47.00 to 48.00
No. 1 machinery cast.	50.00 to 51.00
Stove plate	39.00 to 40.00
Malleable	45.00 to 46.00
Stainless	
18-8 bundles	180.00 to 185.00
18-8 turnings	75.00 to 80.00
430 bundles	80.00 to 85.00

Buffalo

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 busheling	29.00 to 30.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	21.00 to 22.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	14.00 to 15.00
Low phos. plate	36.00 to 37.00
Structurals and plate, 2 ft and under	36.00 to 37.00
Scrap rails, random lgth.	37.00 to 38.00
Rails 2 ft and under	47.00 to 48.00
No. 1 machinery cast.	45.00 to 46.00
No. 1 cupola cast.	40.00 to 41.00

St. Louis

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	28.00 to 29.00
Foundry steel, 2 ft.	31.00 to 32.00
No. 1 dealer bundles	32.00 to 33.00
No. 2 bundles	18.00 to 19.00
Machine shop turn.	8.00 to 9.00
Shoveling turnings	10.00 to 11.00
Cast iron borings	18.00 to 19.00
No. 1 RR hvy. melting	31.50 to 32.50
Rails, random lengths	37.00 to 38.00
Rails, 18 in. and under	40.00 to 41.00
RR specialties	38.00 to 39.00
Cupola cast.	42.00 to 43.00
Heavy breakable cast.	34.00 to 35.00
Stove plate	35.00 to 36.00
Cast iron car wheels	35.00 to 36.00
Rerolling rails	48.00 to 49.00
Unstripped motor blocks	36.00 to 37.00

Birmingham

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	23.00 to 24.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	17.00 to 18.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	9.00 to 10.00
Electric furnace bundles	32.00 to 33.00
Elec. furnace, 3 ft & under	32.00 to 33.00
Bar crops and plate	36.00 to 37.00
Structural and plate, 2 ft.	35.00 to 36.00
No. 1 RR hvy. melting	28.00 to 29.00
Scrap rails, random lgth.	39.00 to 40.00
Rails, 18 in. and under	45.00 to 46.00
Angles and splice bars	37.00 to 38.00
No. 1 cupola cast.	45.00 to 46.00
Stove plate	45.00 to 46.00
Cast iron car wheels	37.00 to 38.00
Unstripped motor blocks	35.00 to 36.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	21.00 to 22.00
No. 2 dealer bundles	16.00 to 17.00
Machine shop turnings	7.00 to 8.00
Mixed bor. and turn.	9.00 to 10.00
Shoveling turnings	10.00 to 11.00
Clean cast. chem. borings	18.00 to 19.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	34.00 to 35.00
Heavy breakable cast.	32.00 to 33.00
Stainless	
18-8 prepared solids	165.00 to 170.00
18-8 turnings	80.00 to 85.00
430 prepared solids	70.00 to 75.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$24.00 to $25.00
No. 2 hvy. melting	15.00 to 16.00
No. 1 dealer bundles	27.00 to 28.00
No. 2 bundles	15.00 to 16.00
No. 1 busheling	24.00 to 25.00
Drop forge flashings	24.00 to 25.00
Machine shop turn.	8.00 to 9.00
Mixed bor. and turn.	11.00 to 12.00
Shoveling turnings	11.00 to 12.00
Cast iron borings	11.00 to 12.00
Heavy breakable cast.	29.00 to 30.00
Mixed cupola cast.	33.00 to 34.00
Automotive cast.	42.00 to 43.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	60.00 to 65.00
430 bundles and solids	60.00 to 65.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$24.00 to $24.50
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	24.00 to 24.50
No. 2 bundles	14.00 to 15.00
No. 1 busheling	24.00 to 24.50
Machine shop turn.	5.00 to 6.00
Shoveling turnings	8.50 to 9.50
Clean cast. chem. borings	12.00 to 13.00
No. 1 machinery cast.	38.00 to 39.00
Mixed cupola cast.	32.00 to 33.00
Heavy breakable cast.	27.50 to 28.50

San Francisco

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	30.00
No. 2 bundles	20.00
Machine shop turn.	$14.00 to 15.00
Cast iron borings	14.00 to 15.00
No. 1 cupola cast.	46.00

Los Angeles

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	29.00
No. 1 dealer bundles	27.00
No. 2 bundles	17.00
Machine shop turn.	13.00
Shoveling turnings	15.00
Cast iron borings	$15.00 to 16.00
Elec. furnace 1 ft and under (foundry)	42.00 to 43.00
No. 1 cupola cast.	42.00 to 43.00

Seattle

No. 1 hvy. melting	$35.00
No. 2 hvy. melting	33.00
No. 2 bundles	22.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

Brokers buying prices per net ton on cars:

No. 1 hvy. melting	$25.80
No. 2 hvy. melting cut 3 ft. and under	22.50
No. 1 dealer bundles	25.80
No. 2 bundles	19.00
Mixed steel scrap	16.00
Bush., new fact., prep'd	25.50
Bush., New fact., unprep'd	20.45
Machine shop turn.	12.00
Short steel turn.	12.00
Mixed bor. and turn.	12.00
Cast scrap	33.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	29.00
No. 2 bundles	18.00
Machine shop turn.	12.00
Shoveling turnings	14.00
Cut structural plate 2 ft & under	$40.00 to 41.00
Unstripped motor blocks	26.00 to 27.00
Cupola cast.	32.00 to 33.00
Heavy breakable cast.	25.00 to 26.00

speaking of operations

Some 5000 years ago, the Egyptians used instruments for operations and amputations . . . Under Hammurabi's laws, a Babylonian surgeon was awarded 10 shekels of silver for successfully operating on an eye abscess . . . More than 12 centuries before Hippocrates, surgeons in India employed 101 types of instruments, including some for such plastic operations as replacing noses, ears and lips lost in battle.

To Ambroise Paré, a 16th Century Parisian, are credited countless innovations in the art of surgery—and many types of forceps, cauteries, knives, retractors, and other instruments were illustrated in his books.

For today's iron lungs or artificial hearts—for the operation on an appendix or the operation of the country's 7000 hospitals—current needs for instruments, equipment and facilities continue to multiply the demands for steel.

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1960—OUR 50th YEAR

Primary Metal Import Pattern Changing

New trends are appearing rapidly in the nonferrous metal picture. In contrast to 1959, buying has taken on a new pattern.

Foreign sources of aluminum have all but dried up. Copper and brass business is off from last year.

■ The pattern of nonferrous primary metal and mill product imports is changing.

The exact direction of the new trends differ from metal to metal. But behind all of them is one or more of the following: The current economic boom in Europe. The business slide in the U. S. Attitudes and actions of the U. S. government.

Long View—Perhaps the most far reaching change is in aluminum. But you have to look past the statistics to see it.

The Midyear Review and Outlook on Aluminum of the U. S. Commerce Dept. notes a very slight decline in aluminum imports through the first four months of the year. The total dropped from 142,325,000 lb in January-April 1959 to 131,189,000 lb in the like period of this year. This is down less than 8 pct.

All Gone—Most of the aluminum coming into the U. S. now is on old or long term orders. The foreign sources of supply have all but dried up.

"We're sold out for the year," says an agent for a foreign producer.

"I haven't been able to get any aluminum to sell in the U. S. for most of the year," reports an international metal merchant.

Why the change?

Heavy Demand—They're making more aluminum than ever in Europe, say metal traders. But demand is way ahead of supply and growing faster.

In fact one New York trader reports, "Our import-export business is just about the exact opposite of what it was last year. Then we were importing about twice as much aluminum as we were exporting. This year it's just the opposite."

Commerce Dept. figures do indicate the sharp climb in exports. The total for the first four months of 1960 was 307,009,000 lb, compared to 56,458,000 lb in the first four months of 1959, they are up over 443 pct.

The Other Way—In copper and brass the situation is very different.

"Business is off about 30 pct this year," reports one trader. Another says, "I'm getting more business than last year in brass."

What's the difference? "The trader or merchant is dead in this kind of a soft market," says the man with the better business. He's the agent for foreign producers.

Both traders and agents agree that this market is thinning out the number of copper and brass importers. When the soft market settles there'll be about 50 pct fewer, says one trader.

In lead and zinc importing, the little merchant has been all but knocked out of the market. The complexity of operating under the quota system often takes away the margin of profit.

"We had a nice profitable import business going in lead and zinc," says one New York trader. "But we dropped completely off the market right after import quotas were passed.

Aluminum

Aluminum Ltd., the major Canadian producer, is installing 6000 to 8000 tons of additional capacity at Arvida, Quebec.

The unusual thing is that the aluminum will be produced by what Nathanael Davis, company president, calls "a basically new process."

It uses bauxite of about the same quality as in conventional aluminum making. And it uses about the same amount of power. But beyond that neither Mr. Davis nor H. H. Richardson, chief technical officer of the company, will comment.

Advantages claimed for the new process: "It gives promise of substantial savings in other elements of production cost, and in the investment required per ton of capacity."

The new unit, basically experimental, will cost $4 million and be in operation within two years.

Tin prices for the week: July 20—104.25; July 21—104.75; July 22—104.75; July 26—104.375; July 27—104.25*.

* Estimate

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	26.00	24.70	12/17/59
Aluminum ingot	28.10	26.80	12/17/59
Copper (E)	33.00	30-33	11/12/59
Copper (CS)	33.00	35.00	3/11/60
Copper (L)	33.00	31.50	11/6/59
Lead, St. L.	11.60	12.30	12/21/59
Lead, N. Y.	12.00	12.50	12/21/59
Magnesium ingot	36.00	34.50	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	64.50	12/6/56
Titanium sponge	150-160	162-182	8/1/59
Zinc, E. St. L.	13.00	12.50	1/8/60
Zinc, N. Y.	13.50	13.00	1/8/60

ALUMINUM: 99% Ingot COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. TIN: See above; **Other primary prices, pg. 120.**

TOUGH DIET FOR TIN PLATE

Canned fruit salads may be easy on fashion-trim figures but they're murder on containers. To withstand biting food acids, the tin plate must be securely bonded to the steel . . . a trick that calls for thorough cleaning of the steel before plating. One of the latest Pennsalt cleaners does the job in superior fashion. In fact, nine out of ten cans produced today get their start with Pennsalt tin mill cleaners.

The first job-engineered tin mill cleaners were pioneered by Pennsalt some 23 years ago. Pennsalt has maintained its leadership by keeping pace with changes in plating, rolling and annealing techniques . . . and today offers a complete line of cleaners to meet modern tin mill requirements. The same chemical ingenuity and application experience are key ingredients in the broad line of chemicals and equipment which Pennsalt supplies to the metalworking industry. Write or call us for a consultation on your own finishing problem.

. . . a better start for your finish®

METAL PROCESSING DEPARTMENT

PENNSALT CHEMICALS CORPORATION

East: 3 Penn Center, Philadelphia 2, Pa.

West: 2700 S. Eastern Ave., Los Angeles 22, Calif.

Pennsalt Chemicals of Canada Ltd., Oakville, Ont. • Industrial Química Pennsalt, Mexico City

Pennsalt Chemicals®

ESTABLISHED 1850

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.038	.048-.061	.077-.096	.136-.250
1100, 3003	47.8	47.3	46.2	45.1
5052	54.2	53.0	50.8	49.2
6061-0	51.0	49.8	47.9	46.0

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
1-17	44.7-46.2	53.2-60.8
18-32	45.2-46.8	57.7-79.9
33-38	48.8-51.4	83.3-94.5
39-44	58.7-62.4	99.9-121.0

Screw Machine Stock—2011-T-3

Size"	¼	⅜-⅝	¾-1	1¼-1½
Price	62.0	61.2	59.7	57.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.411	$1.884	$2.353	$2.823
.024 gage	1.762	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	96.9	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	138	120	138
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	130	110	126
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	57.13	.....	54.86	58.32
Brass, Yellow	50.57	50.86	50.26	54.23
Brass, Low	53.53	53.82	53.22	57.09
Brass, R L	54.58	54.87	54.27	58.14
Brass, Naval	55.12	.....	48.68	58.78
Muntz Metal	53.20	.....	48.26	.....
Momm. Bz.	56.17	56.46	55.86	59.48
Mang. Bz.	58.86	.....	52.21	.....
Phos. Bz. 5%	77.44	.....	78.10	.....

Free Cutting Brass Rod 36.06

TITANIUM

(Base prices f.o.b. mill)

Sheet and strip, commercially pure, $6.75-$13.00; alloy, $13.40-$17.00. Plate, HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; bar, HR or forged, commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 29.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be $65.00
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.50
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic base.... $ 1.31
Cobalt, 97-99% (per lb) ....$1.50 to $1.57
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 29.95 to 36.95
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9%, dollars per troy oz.. $2.25
Iridium, dollars per troy oz.....$75 to $85
Lithium, 98% .....$9.00 to $12.00
Magnesium sticks, 10,000 lb. 57.00
Mercury, dollars per 76-lb flask f.o.b. New York .....$210 to $212
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel 69.60
Palladium, dollars per troy oz..$24 to $26
Platinum, dollars per troy oz...$82 to $85
Rhodium .....$137 to $140
Silver ingots (¢ per troy oz.).....91.375
Thorium, per kg. $43.00
Vanadium .....$ 3.65
Zirconium sponge .....$ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 29.25
No. 120 ..... 28.25
No. 123 ..... 27.25
80-10-10 ingot
No. 305 ..... 33.75
No. 315 ..... 31.50
88-10-2 ingot
No. 210 ..... 42.00
No. 215 ..... 38.75
No. 245 ..... 34.00
Yellow ingot
No. 405 ..... 23.75
Manganese bronze
No. 421 ..... 28.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 25.75-26.00
0.60 copper max. 25.50-25.75
Piston alloys (No. 132 type)..28.00-29.00
No. 12 alum. (No. 2 grade)...24.75-25.25
108 alloy 25.25-25.75
195 alloy 27.75-28.75
13 alloy (0.60 copper max.)...25.75-26.00
AXS-679 (1 pct zinc) 25.00-26.00

Steel deoxidizing aluminum notch bar granulated or shot
Grade 1—95-97½% 25.25-26.25
Grade 2—92-95% 24.00-25.00
Grade 3—90-92% 23.00-24.00
Grade 4—85-90% 22.50-23.50

(Effective July 26, 1960)

SCRAP METAL

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	29	28¼
Yellow brass	22¼	20¼
Red brass	25⅜	25
Comm. bronze	26⅛	26
Mang. bronze	20¾	20
Free cutting rod ends.	21¼	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 27½
No. 2 copper wire 25½
Light copper 23¼
*Refinery brass 23½
Copper bearing material 22½
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 27¼
No. 2 copper wire 25½
Light copper 22
No. 1 composition 21
No. 1 comp. turnings 20½
Hvy. yellow brass solids 16
Brass pipe 15
Radiators 17
Aluminum
Mixed old cast. ..... 13½—14
Mixed new clips ..... 15 —15½
Mixed turnings, dry ..... 14 —14½

Dealers' Scrap

(Dealers' Buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 23 —24
No. 2 copper wire ..... 21½—22
Light copper ..... 19½—20
Auto radiators (unsweated).. 13¼—13¾
No. 1 composition ..... 18 —18½
No. 1 composition turnings... 16½—17
Cocks and faucets ..... 13¾—14¼
Clean heavy yellow brass .... 12¾—13¼
Brass pipe ..... 14¼—14¾
New soft brass clippings .... 14¼—14¾
No. 1 brass rod turnings .... 13¼—13¾

Aluminum

Alum. pistons and struts .... 7½— 8
Aluminum crankcase ..... 11¼—11¾
1100 (2s) aluminum clippings 15 —15½
Old sheet and utensils ..... 11¼—11¾
Borings and turnings ..... 7 — 7½
Industrial castings ..... 11¼—11¾
2020 (24s) clippings ..... 12½—13

Zinc

New zinc clippings ..... 7 — 7¼
Old zinc ..... 4½— 5
Zinc routings ..... 3¼— 3½
Old die cast scrap ..... 2¾— 3

Nickel and Monel

Pure nickel clippings 52-54
Clean nickel turnings 40
Nickel anodes 52-54
Nickel rod ends 52-54
New Monel clippings 28-29
Clean Monel turnings 20-23
Old sheet Monel 24-26
Nickel silver clippings, mixed 18
Nickel silver turnings, mixed 15

Lead

Soft scrap lead ..... 8 — 8¼
Battery plates (dry) ..... 3 — 3¼
Batteries, acid free ..... 2 — 2¼

Miscellaneous

Block tin ..... 75 —76
No. 1 pewter ..... 55 —56
Auto babbitt ..... 39 —40
Mixed common babbitt ..... 9¾—10⅛
Solder joints ..... 13¼—13⅝
Siphon tops 41
Small foundry type ..... 9¾—10¼
Monotype ..... 9¾—10⅛
Lino. and stereotype ..... 8¾— 9
Electrotype ..... 7½— 7¾
Hand picked type shells ..... 5¼— 5⅜
Lino. and stereo. dross ..... 2¼— 2⅜
Electro dross ..... 2¼— 2⅜

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3,*	7.425 *S10, R2*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$104.50 *A2*	$126.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				15.90 *T8*
	New Castle, Pa.									7.425* *M8*				
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*		5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3, T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.525 *A1, T8, M8* 7.525* *M8*	7.575 *W8*		8.40 *W8, S9,I3*	15.55 *A1, S9,C4,T8*
	Cleveland, Ohio									7.425 *A5,J3*		10.75 *A5*	8.40 *J3*	15.60 *N7*
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1,P11*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*					5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *J3,B4* 7.525 *E3*			8.40 *S9*	15.55 *S9* 15.60 *N7*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*			6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

• Electro-galvanized-plus galvanizing extras.

(Effective July 26, 1960)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Coke* *1.25*-lb. base box	Electro** *0.25*-lb. base box	Hollowware Enameling *29* ga.
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*	† Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price, 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.												
	Conshohocken, Pa.												
	Contesville, Pa.												
	Harrisburg, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*						
	Hartford, Conn.												
	Johnstown, Pa.												
	Fairless, Pa.	5.15 *UI*	6.325 *UI*				7.575 *UI*	9.325 *UI*		6.40 *B3*	$10.50 *UI*	$9.20 *UI*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*	6.775 *B3*		7.525 *B3*	9.275 *B3*	10.025 *B3*	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	
	Worcester, Mass.									6.70 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*						
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*									
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *UI, W8*			6.40 *A5, R3, W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3**	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*		6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*					
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *UI, I3, Y1*	6.275 *UI, I3, Y1*	6.875 *UI, I3*	6.775 *UI, I3, Y1*	7.225 *UI*	7.525 *UI, Y1, I3*	9.275 *UI, Y1*		6.40 *Y1*	$10.40 *UI, Y1*	$9.10 *I3, UI, Y1*	7.85 *UI, Y1*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	7.95 *G2*
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*							
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3* 7.65 *R3**	6.775 *S1*	7.225 *S1**, *R3*	7.525 *R3, S1*	9.275 *R3,*				$9.10 *R3*	
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 *UI, J3, P6*	6.275 *UI, J3, P6*	6.875 *UI, J3* 7.50 *E3**	6.775 *UI*		7.525 *UI, J3*	9.275 *UI, J3*	10.025 *UI, J3*	6.40 *A5, J3, P6*	$10.40 *UI, J3*	$9.10 *UI, J3*	7.85 *UI, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5* 7.50 *W3**		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*			$10.40 *W5, W3*	$9.10 *W5, W3*	7.85 *W5*
	Youngstown, Ohio	5.10 *UI, Y1*	6.275 *Y1*	7.50 *J3**	6.775 *Y1*		7.525 *Y1*	9.275 *Y1*		6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*				8.25 *K1*	10.40 *K1*			$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2, R3*	$10.50 *T2*	$9.20 *T2*	
	Houston, Texas									6.65 *S2*			

? Electrogalvanized sheets.

(Effective July 26, 1960)

*7.425 at Sharon-Niles is 7.225

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *C4*		7.50 *C4*	7.95 *C4*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Harrisburg, Pa.							5.30 *P2*	6.375 *P2*			
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Fairless, Pa.	5.825 *U1*	5.825 *U1*		6.875 *U1*							
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*					--	8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7,A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3, T5*	9.025 *R3,R2, T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875 *L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,13*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Plymouth, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8,B5* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5,P8* 9.225 *B5,P3*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5.675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, I1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*				7.925 *N4*	5.30 *N4*			7.625 *N4*	8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.30 *W5*				
	Youngstown, Ohio	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, B5*	7.775 *B2*	11.00 *P14, B5*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*	6.425 *B2,A10*				9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga.	5.875 *A8*	5.25 *A8*									8.00 *A8*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective July 26, 1960) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brooke Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
M10 Mill Strip Products Co., New Castle, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Steel Corp., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
		Hot-Rolled (18 ga. & hvr.)	Cold-Rolled (15 gage)	Galvanized (10 gage)††	Hot-Rolled		Standard Structural	Hot-Rolled (merchant)	Cold-Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 Annealed
Atlanta		9.37	10.61	11.83	10.85	9.73	9.94	9.53	13.24	.....	.....	.....	.....
Baltimore**	$.10	8.37	9.71	10.16	10.78	8.94	9.63	9.15	11.90	17.48	16.48	21.58	20.83
Birmingham**		8.46	10.20	10.69	9.45	8.41	8.47	8.26	13.14	16.76	.....	.....	.....
Boston**	.10	9.84	10.68	11.87	12.26	9.72	10.26	9.87	13.45	17.69	16.69	21.79	21.04
Buffalo**	.15	8.95	10.10	11.30	10.80	9.15	9.80	9.15	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	8.72	10.35	10.30	10.89	8.56	9.06	8.99	10.80	17.10	16.10	21.20	20.45
Cincinnati**	.15	8.89	10.41	10.35	11.21	8.94	9.62	9.31	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	8.72[1]	10.13	11.39	11.01	8.80	9.45	9.11	11.40	17.21	16.21	21.31	20.56
Denver	.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19	.....	.....	.....	20.84
Detroit**	.15	8.98	10.61	10.65	11.26	8.93	9.62	9.01	11.16	17.38	16.38	21.48	20.73
Houston**		9.22	9.65	12.19[3]	10.78	8.95	8.86	8.63	13.10	17.50	16.55	21.55	20.85
Kansas City**	.15	9.36	11.02	11.50	11.02	9.25	9.95	9.46	11.72	17.17	15.87	21.87	21.12
Los Angeles**		9.59[1]	11.29	12.20	11.29	9.82	10.54	9.67	14.20	18.30	17.35	22.90	22.20
Memphis**	.15	9.99	10.20	.....	11.39	10.27	10.48	10.07	12.89	.....	.....	.....	.....
Milwaukee**	.15	8.86	10.49	10.44	11.03	8.70	9.28	9.13	11.04	17.24	16.24	21.24	20.49
New York	.10	9.46	10.23	11.45	11.56	9.61	10.30	9.84	13.35	17.50	16.48	21.60	20.85
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia**	.10	8.95	9.70	10.76	10.95	9.30	9.95	9.35	12.05	17.48	16.48	21.58	20.83
Pittsburgh**	.15	8.72	10.13	11.28	10.99	8.56	9.06	9.00	11.40	17.10	16.10	19.70	20.45
Portland**		10.20	12.05	12.35	12.20	10.35	10.80	10.20	16.65	18.50	17.45	20.75	20.25
San Francisco**	.10	10.27	11.79[2]	11.55	11.88	10.48	10.50	10.17	15.20	18.30	17.35	22.90	22.20
Seattle**		10.51	11.57	12.50	11.95	10.10	10.65	9.94	16.20	18.60	17.80	22.70	22.20
Spokane**	.15	10.07	11.44	12.05	11.84	10.17	10.59	9.96	16.35	17.75	17.95	21.58	22.35
St. Louis**	.15	8.92	10.75	10.68	11.09	8.77	9.29	8.97	11.43	17.48	16.48	21.58	20.83
St. Paul**	.15	8.99	9.74	10.99	11.16	8.83	9.33	8.97	11.64	.....	16.69	.....	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** These cities are on net pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—¼" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—⅝-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅝" to 2⅜"; cold drawn—15/16" to 2⅜" round; Hot-rolled 4140—⅝" to 2⅜" round, cold drawn—15/16" to 2⅜" round.

†† 13e zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective July 26, 1960)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	73.00
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	71.50†
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	68.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.00	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Lyles, Tenn. *T3*	.....	.....	.....	.....	73.00
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Rockwood *T3*	62.00	62.50	66.50	67.00	73.00
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	73.00†
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1, I4*, (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $89.00; (15.51-16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

FASTENERS

(Base discounts, f.o.b. mill, based on latest list prices)

Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

(Discount for 1 container)	Pct
Plain finish—packaged and bulk	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

(Discount for 1 container)	Pct
Plain finish—packaged and bulk	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

(Discount for 1 container)

Plain finish—packaged and bulk	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

(On all the above categories add 25 pct for less than container quantities. Minimum plating charge—$10.00 per item. Add 7½ pct for nuts assembled to bolts)

Machine Screws and Stove Bolts

(Packages—plain finish)

	Discount Screws	Bolts
Full Cartons	46	46

Machine Screws—bulk

¼ in. diam or smaller	25,000 pcs	50
5/16, ⅜ & ½ in. diam	15,000 pcs	50

Machine Screw and Stove Bolt Nuts

(Packages—plain finish)

	Discount Hex	Square
Full Cartons	46	57
Bulk		
¼ in. diam or smaller	25,000 pcs	
5/16 or ⅜ in. diam	56	60
	15,000 pcs	
	56	60

Rivets

	Base per 100 lb
½ in. diam and larger	$12.85
	Pct Off List
7/16 in. and smaller	15

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	2	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

(Effective July 26, 1960)

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	28.00	31.50	29.00	32.75	33.25	34.50	51.25	41.50	48.25	—	22.25	—	22.50
Billets, forging	—	37.75	38.75	39.50	42.50	42.00	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	49.50	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25 31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	43.75	68.50	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	47.00	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7,* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13,* (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1,* (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Ambridge, Pa., *B7.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8* (down to and including ¼").

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3,* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Ambridge, Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa., *C2.*

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Ann'ld	Merch. Wire Galv.
	Col	Col	Col	Col	Col	¢/lb.	¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3****	173	190	...	...	190	9.00	9.675
Atlanta *A8***	173	191	...	212	197	9.00	9.75
Bartonville *K2***	175	193	183	214	199	9.10	9.85
Buffalo *W6*	.....	.....	.....	.....	.....	9.00	9.55*
Chicago *N4*	173	191	177	212	197	9.00	9.75
Chicago *R3*	.....	.....	.....	.....	.....	9.00	9.55
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dsv. *M4***	175	193	...	214	199	9.10	9.85
Donora, Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	177	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	184-1	197	...	219	203	9.10	9.775
Johnstown *B3***	173	190	177	...	196	9.00	9.675
Joliet, Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9**	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Palmer,Mass *W6*	.....	.....	.....	.....	.....	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	...	...	213	9.95	10.50
Rankin Pa. *A5*	173	187	...	...	193	9.00	9.55
So. Chicago *R3*	173	187	...	...	193	8.65	9.20
S. San Fran. *C6*	.....	.....	.....	236	.....	9.95	10.50
SparrowsPt. *B3***	175	.....	.....	215	198	9.10	9.775
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.20
Worcester *A5*	179	.....	.....	.....	.....	9.30	9.85
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢. *** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras.
‡ Wholesalers only.

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

STANDARD T. & C.	BUTTWELD ½ In. Blk.	½ In. Gal.	¾ In. Blk.	¾ In. Gal.	1 In. Blk.	1 In. Gal.	1¼ In. Blk.	1¼ In. Gal.	1½ In. Blk.	1½ In. Gal.	2 In. Blk.	2 In. Gal.	2½-3 In. Blk.	2½-3 In. Gal.	SEAMLESS 2 In. Blk.	2 In. Gal.	2½ In. Blk.	2½ In. Gal.	3 In. Blk.	3 In. Gal.	3½-4 In. Blk.	3½-4 In. Gal.
Sparrows Pt. *B3*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *R3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	.....	.....	.....	.....	.....	.....	.....	.....
Fontana *K1*	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Alton, Ill. *L1*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50	.....	.....	.....	.....	.....	.....	.....	.....
Sharon *M3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	.....	.....	.....	.....	.....	.....	.....	.....
Fairless *N2*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Wheeling *W5*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	.....	.....	.....	.....	.....	.....	.....	.....
Wheatland *W4*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Indiana Harbor *Y1*	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50	.....	.....	.....	.....	.....	.....	.....	.....
Lorain *N2*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *R3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	.....	.....	.....	.....	.....	.....	.....	.....
Fairless *N2*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50	.....	.....	.....	.....	.....	.....	.....	.....
Fontana *K1*	*6.25	.....	*2.25	.....	0.75	.....	1.25	.....	1.75	.....	2.25	.....	2.75	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Alton, Ill. *L1*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50	.....	.....	.....	.....	.....	.....	.....	.....
Sharon *M3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Wheeling *W5*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	.....	.....	.....	.....	.....	.....	.....	.....
Wheatland *W4*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Indiana Harbor *Y1*	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50	.....	.....	.....	.....	.....	.....	.....	.....
Lorain *N2*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.00¢ per lb.

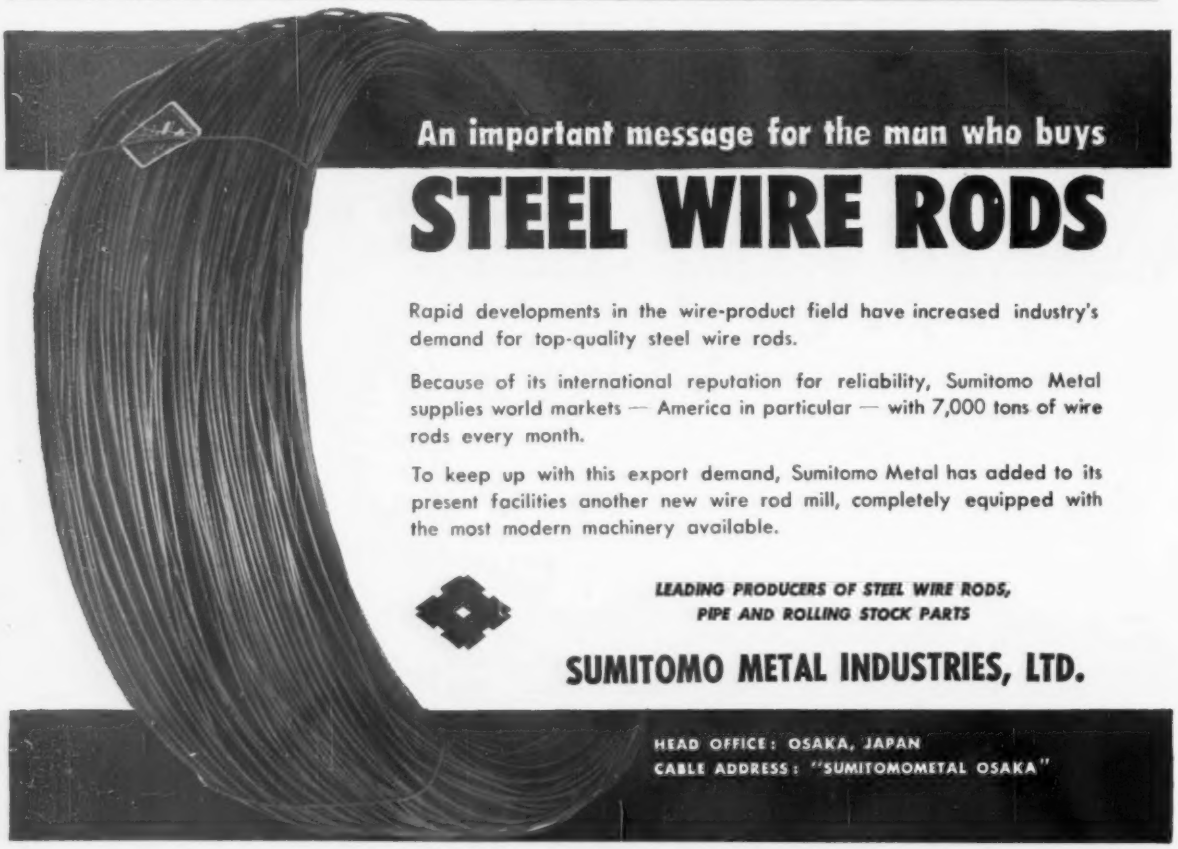
CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.5
Chicago	139.8
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 4 in. or larger, bell and spigot pipe. Explanation: p. 87, Sept. 1, 1956, issue. Source: U. S. Pipe and Foundry Co.

COKE

Furnace, beehive (f.o.b.)	Net-Ton
Connellsville, Pa.	$14.75 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Chattanooga, Tenn.	30.80
Ironton, O., f.o.b.	30.50
Detroit, f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearny, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	32.00
Erie, Pa., f.o.b.	32.00
St. Paul, f.o.b.	31.25
St. Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville, Is., Pa.	30.75


An important message for the man who buys
STEEL WIRE RODS
Rapid developments in the wire-product field have increased industry's demand for top-quality steel wire rods.
Because of its international reputation for reliability, Sumitomo Metal supplies world markets — America in particular — with 7,000 tons of wire rods every month.
To keep up with this export demand, Sumitomo Metal has added to its present facilities another new wire rod mill, completely equipped with the most modern machinery available.
LEADING PRODUCERS OF STEEL WIRE RODS, PIPE AND ROLLING STOCK PARTS
SUMITOMO METAL INDUSTRIES, LTD.
HEAD OFFICE: OSAKA, JAPAN
CABLE ADDRESS: "SUMITOMOMETAL OSAKA"

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.75	6.725	7.25	.....	.....	.....
Cleveland *R3*	.....	.....	.....	10.10	.....	15.35
So. Chicago *R3*	.....	.....	.....	10.10	.....	.....
Ensley *T2*	5.75	6.725	.....	.....	.....	.....
Fairfield *T2*	.....	6.725	.....	10.10	6.875	.....
Gary *U1*	5.75	.....	.....	.....	6.875	.....
Huntington, *C16*	.....	6.725	.....	.....	.....	.....
Ind. Harbor *I3*	.....	.....	.....	10.10	.....	.....
Johnstown *B3*	.....	6.725	.....	.....	.....	.....
Joliet *U1*	.....	.....	7.25	.....	.....	.....
Kansas City *S2*	.....	.....	.....	10.10	.....	15.35
Lackawanna *B3*	5.75	6.725	7.25	.....	6.875	.....
Lebanon *B3*	.....	.....	7.25	.....	.....	15.35
Minnequa *C6*	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh *S14*	.....	.....	.....	.....	.....	15.35
Pittsburgh *J3*	.....	.....	.....	10.10	.....	.....
Seattle *B2*	.....	.....	.....	.....	6.75	15.85
Steelton *B3*	5.75	.....	7.25	.....	6.875	.....
Struthers *Y1*	.....	.....	.....	10.10	.....	.....
Torrance *C7*	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.725	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	10.10	.....	.....

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Anderson, Ind. *G4*	8.95	10.40	12.60	15.60	18.55
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.65	10.40	12.60	15.60	.....
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *R5*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Britain, Conn. *S7, s*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Castle, Pa. *M10, s*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *R5*	9.10	10.55	12.60	15.60	18.55

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper

Rolled elliptical, 18 in. or longer, 5000 lb lots 48.00

Electrodeposited, 5000 lb lots ... 39.50

Brass, 80-20, ball anodes, 2000 lb or more 53.00

Zinc, ball anodes, 2000 lb lots 20.50

(for elliptical add 1¢ per lb)

Nickel, 99 pct plus, rolled carbon, 5000 lb 1.0225

(Rolled depolarized add 3¢ per lb)

Cadmium, 5000 lb 1.40

Tin, ball anodes $1.05 per lb (approx.).

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum..... 65.90

Copper sulphate, 25.2 Cu min, 6000 to 12,000 lbs per cwt $13.75

Nickel sulfate, 5000 to 23,000 lbs... 29.00

Nickel chloride, freight allowed, 100 lb 45.00

Sodium cyanide, domestic, f.o.b. Chicago, 200 lb drums 25.00

Zinc cyanide, 100 lb 60.75

Potassium cyanide, 100 lb drum N. Y. 45.50

Chromic acid, flake type, 10,000 lb or more 30.44

METAL POWDERS

(Cents per lb, f.o.b. shipping point for ton lots or over, except as noted)

Iron Powders

Molding grade, domestic and foreign, 98 pct Fe, 100 mesh bags, freight allowed east of Miss. R. 11.50

Electrolytic Iron, melting stock, 99.87 pct Fe, truckload lots 25.75

Carbonyl Iron (200 lb lots) 88.00

Welding Grades 8.10

Cutting and Scarfing Grades 9.85

Hydrogen reduced, domestic 11.25

Copper Powders

Molding Grades

Electrolytic, domestic, f.o.b. shipping point. 15.00†

Atomized ..... 46.5 to 64.5

Reduced ..... 15.00†

Chemically Precipitated 15.00†

Brass, 5000-lb lots ..... 35.1 to 52.2

Bronze, 5000-lb lots ..... 53.1 to 56.7

Chromium, electrolytic 5.00

Lead ..... 7.50†

Manganese, electrolytic ... $1.00

Molybdenum .....$3.60 to $4.35

Nickel $1.15

Carbonyl Nickel, 20,000 lb lots $1.01

Nickel-Silver, 5000 lb lots.. 60.7 to 69.0

Silicon 70.00

Solder ..... 7.00†

Stainless Steel, 316 ..... $1.07

Stainless steel 304 ..... 89.00

Tin ..... 14.00†

Titanium, 99.25 + pct, per lb, f.o.b. $11.25

Tungsten .....$3.15 (nominal)

† Plus cost of metal.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	.....	9.875	.....
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor	.....	12.475	.....
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30	Grain Oriented	
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Aliquippa (*J3*); Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*S1*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

CLAD STEEL

Base prices, cents per lb f.o.b.

Stainless Type	Cladding	Plate (*L4, C4, A3, J2*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
	302	.....	.....	.....	37.50
	304	28.80	31.55	34.30	40.00
	316	42.20	46.25	50.25	58.75
	321	34.50	37.75	41.05	47.25
	347	40.80	44.65	48.55	57.00
	405	24.60	26.90	29.25	.....
	410	22.70	24.85	27.00	.....
	430	23.45	25.65	27.90	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 44.20; 1 side, 36.80.

(Effective July 26, 1960)

REFRACTORIES

Fire Clay Brick

Carloads per 1000

Super duty, Mo., Pa., Md., Ky.... $185.00

High duty (except Salina, Pa., add $5.00) 140.00

Medium duty 125.00

Low duty (except Salina, Pa., add $2.00) 103.00

Ground fire clay, net ton, bulk... 22.50

Silica Brick

Mt. Union, Pa., Ensley, Ala. $158.00

Childs, Hays, Latrobe, Pa. 163.00

Chicago District 168.00

Western Utah 183.00

California 165.00

Super Duty

Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville 163.00-168.00

Silica cement, net ton, bulk, Latrobe 29.75

Silica cement, net ton, bulk, Chicago 26.75

Silica cement, net ton, bulk, Ensley, Ala. 27.75

Silica cement, net ton, bulk, Mt. Union 25.75

Silica cement, net ton, bulk, Utah and Calif. 39.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.$109.00

Standard chemically bonded, Curtliner, Calif. 119.00

Burned, Balt. 103.00

Magnesite Brick

Standard, Baltimore $140.00

Chemically bonded, Baltimore 119.00

Grain Magnesite

St. ⅝ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk. $73.00

Domestic, f.o.b. Chewalah, Wash., Luning, Nev.

in bulk 46.00

in sacks $2.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in:

Pa., W. Va., Ohio $16.75

Missouri Valley 15.60

Midwest 17.00

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	27.25	40	100,110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

* Prices shown cover carbon nipples.

BOILER TUBES

$ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox..	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
National Tube.....	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
Pittsburgh Steel...	2	13	40.28	47.21	.....
	2½	12	54.23	63.57	.....
	3	12	62.62	73.40	.....
	3½	11	73.11	85.70	.....
	4	10	97.08	113.80	.....

VARIABLE VOLTAGE DRIVES
3 PHASE 60 CYCLE

Quan. Size Description
2—3000 HP DC MOTORS—525 V. 600 RPM Whse. M. G. Sets—2500 K.W. Whse., 2300/4160 V.
1—2750 HP DC MOTOR 450 V. 300 RPM Elliott 2200 K.W., Gen. Elec. 3 unit 450 V. DC Gen. with 3000 H.P. 720 RPM, 2300 V. AC Motor and Etc.
1—2250 HP DC MOTOR 600 V. 400/500 RPM, G.E. M.G. Set—2000 K.W. G.E. AC Motor—2300 V.
1—1500 HP DC MOTOR 600 V. 600 RPM Whse. M. G. Set. 1500 K.W. G.E. 13,200 V.
1—1500 HP DC MOTOR 600 V. 300/700 RPM Whse. M.G. Set—1500 K.W. G.E. 13,200 V.
For listing of Motors, Generators, Transformers, M.G. Sets, Rectifiers, Mill Motors, etc.
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47 Howell St., Jersey City, N. J.
Tel. Oldfield 3-3334

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USED and RECONDITIONED
RAILWAY CARS and REPAIR PARTS

FLAT CARS
4—50-Ton Capacity, 43' long
Steel Underframe

30—Used, All-Steel
30-Cubic Yard, 50-Ton Capacity
MAGOR AIR DUMP CARS
Excellent Condition—Immediate Delivery

DIESEL-ELECTRIC LOCOMOTIVES
1, G. E. 25-Ton, 150 H.P., Std. Ga.
3, G. E. 44-Ton, 400 H.P., Std. Ga.
1, G. E. 80-Ton, 500 H.P., Std. Ga.
1, BALDWIN, 120-Ton, 1000 H.P. Std. Ga.

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TO YOUR SPECIFICATIONS
OR BUILD NEW
AS REQUIRED

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NEW YORK 7, N. Y.
PLANT: LANDISVILLE, PA.

Blues Are Sounded From Pittsburgh

Used machinery dealers in Pittsburgh are down-in-the-mouth. Business has gone from bad to worse.

The blame goes to the effects of the steel situation and a lack of inquiries.

■ Pittsburgh dealers are saying that used machinery business has turned from bad to worse. Receiving the blame for this drop are the direct and psychological effects of the steel slump.

For one supplier of electrical equipment, July is shaping up as the worst month since 1954. Business is down below the levels of 1958. June was down 20 to 30 pct from normal and July is down 50 pct.

According to this dealer, the slump seems to be local. Rubber plants, coal mines and other activities outside the district are still ordering equipment. But steel mills, the main customer for the local market, have stopped buying almost completely.

Just No Inquiries—The situation is not one where orders can be developed with a little extra push. A special promotion campaign of one dealer, for example, produced negligible results. There are just no inquiries.

The weakness of demand has put pressure on prices of electrical equipment. According to a dealer, the few sales that are made involve price cutting. Customers who do not normally haggle over price are now marking down orders. This practice has been adopted by companies of all sizes.

Price warfare in the electrical industry has not generally helped matters. In recent months, new motors have been selling with discounts up to 55 pct. There are signs, however, that prices may be firming up in the new equipment end of the business.

Optimistic Talk—A supplier of general machinery talks a little more optimistically. He says July is down from June but there is interest and there are potential buyers. However, the same dealer concedes that July volume will be a six-year low unless some big orders develop in the next few weeks.

In the general machinery line, there are inquiries out on lathes and shears. But one dealer reports he has been unable to locate the late model units demanded by customers.

A supplier of materials handling equipment says business is spotty and generally down. What little activity there is centers on the lighter cranes, ranging in price from $800 to $2000.

The Long Wait?—In the opinion of this dealer, the lag is caused by the psychological effects of the steel slump. Many smaller plants seem to be operating well, but they look at the steel operating rate and say they will wait until things get better.

For a supplier of steel mill equipment, there is no clear trend. Two new steel mills are planned in Florida and Texas. If these go through, they could produce orders for bar mills. One or two big jobs like this could make the year a good one.

BALER
1A Harris, Box 60"x22"x18", Bale 10"x12"x16"
BAR TURNERS
#6 Medart RPG Bar Turner, Capacity 6" diameter, 20 ft. Length
BENDING ROLLS
13' x 3/16" Bertsch Initial Type—NEW 1957
12' x 1½" Bertsch Initial Type—NEW 1956
32' x ¾" Baldwin Pyramid Type—NEW 1942
BRAKES—PRESS TYPE
16' x 5/32" Dreis & Krump Model 516-D
10' x ¾" Pacific Model 500-17 Hydraulic
BRAKE—LEAF TYPE
12' x ¼" Dreis & Krump "Chicago" No. 226
FORGING MACHINE
2" Hill Acme Model "XN"—NEW 1953
FURNACES—MELTING
3 AJAX Electrothermic Induction Melting, 6000#, 3000# and 650#
Swindell Top Charge, Tilt Type, 12 ft. Shell Complete with transformer equipment
HAMMER
4000# Chambersburg Ceco Drop—NEW 1952
HEADER
#55 Waterbury Farrel DSOD, Capacity up to ¾" Diameter
LEVELERS
96" Hilles & Jones, 4 Rolls 12" Diameter
72" Hilles & Jones, 6 Rolls 7" Diameter

PAINT SYSTEM
Electro-Static Paint System, Complete equipment including conveyor
PRESS—KNUCKLE
600 ton Toledo #664, 2" Stroke, Bed Area 24" x 28"
PRESSES—HYDRAULIC
75 ton W&W Straightening Press, 14" Stroke, Area of Table 124" x 60"
1200 ton United States Hydr. Forging Press, Stroke of ram 4', CtoC of Cols. 8'x3'6"
4500 ton B-L-H Hydr. Press, 40" Stroke, 68½ x 68½ Between Columns
ROLLING MILLS
Complete Copper Hot Rolling Mill, Starting size copper bar 4x4x46", Finish size 5/16"
17" x 28" Waterbury Farrel Single Stand 2-Hi
40"x26½"x12" Lewis 3-High Plate Mill
ROLLS—FORMING
5 Stand Bliss, 3" Spindles, With coil holder, cut-off, straightener, runout table
ROLL—TAPER FORGING
#0 Ajax, With cut-off & forging attachment
SCRAP CHOPPER
#2 Yoder 48" Lawn Mower Rotary Scrap Chopper
SHEAR—ALLIGATOR
#00 Canton, ¾" Capy., With 3 HP AC Motor
#3½ Lewis All Steel, Capy. 4" Rd. 3¾" Sq.
SHEAR—BAR
#26 Pels Type RFV, Capy. 2½" Rd., 2¾" Sq.

SHEAR—GATE
8' x ⅝" Beatty No. 29, V-Belt Drive
SHEARS—SQUARING
10' x ⅝" Niagara No. 910
12' x ¼" Cincinnati, 18" Gap
SHEARS—MISCELLANEOUS
72" Cut-Off Line incl. McKay Leveler 17 Rolls 8" Dia., Coil Cradle, Tables, 6'x½" Shear
60" Cut-off Line incl. McKay Leveler 17 Rolls 2⅜" Dia., Tables, 72" x 10 Ga. Shear
36" Hallden Drum Type Shear Line, Designed for 33/38 Ga., Widths 16" to 38"
84" x 3/16" United Cut-Up Shear
DT-36-B Pels Beam Shear, Capy. 3" to 15" beams & channels, 6 x 6 x ⅝" angles
SLITTING LINES
36" Waterbury Farrel, Arbor 4½" Dia.
48" Yoder Arbor 6 in. Dia.
STRAIGHTENERS
#000 Blaw-Knox Medart 2-Roll Rotary
⅝" Lewis #10F, With 16 ft. Cut Off
3/16" Lewis #3F, With 12 ft. Cut Off
WIRE EQUIPMENT
Vaughn 4/5 HIV Motoblox, Start .162" low carbon steel, Finish .076"
#4P Penn Standard Turks Head, 30 H.P. Motor Syncro Model H81-A High Speed 7 Bay Tubular Strander

• Manufacturing **A. T. HENRY & COMPANY, INC.** Equipment •
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Lou F. Kinderman

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FOR SALE

1—34" U.E. & F. Co. Roll Lathe, capacity 16'6" long rolls, 230 volt DC, enclosed geared headstock.
1—15 Ton Morgan O.E.T. Crane, 5 Ton Auxiliary, 60' span, Cab operated, 230 volt DC, Serial #2959.
1—5 Ton Northern O.E.T. Crane Trolley, controls and end trucks. 20 volt DC.
1—15 Roll Backed-up Newbold Roller Leveler, 5½" dia x 66" face rolls, motor driven through gear reducer.
1—17 Roll National Roll & Foundry Co. Roller Leveler 3½" dia. rolls x 60" face.

REBUILT—GUARANTEED ELECTRICAL EQUIPMENT

MOTOR GENERATOR SETS

TYPICAL FOR MILL & REEL DRIVES

(2)—3500/3000-KW Al.Chal. 5-unit Sets, (2) 1750-KW, Gen. 350/300—700/600-V.D.C., (1) 5000-HP Syn. Motor 13800/6900/4160-V., 3 ph., 60 cy., with exciters.
(1)—1225-KW Whse. 2-unit Set, Gen. 600-V.D.C., with 2250-HP Syn. Motor 2300-V., 3 ph., 60 cy.
(1)—1530-KW 3-unit Set, (2) 760-KW Gen., 600-V.D.C., (1) 2250-HP Syn. Motor, 2300-V., 3 ph., 60 cy.
(1)—200-KW General Electric 3-unit Set, (2) 100-KW Gen. 250-V.D.C., with 300 HP Syn. Motor, 2300-V.D.C., 3 ph., 60 cy.

We can supply various Motors with these Sets, together with exciters and controls as a COMPLETE PACKAGE.

DIRECT CURRENT MOTORS
Adjustable and Constant Speed
(Suitable for MILL and STANDARD DUTY)

Qu.	HP	Make	Volts	R.P.M.
1	3000	G.E.	600	90/180
2—N-*	3000	Whse.	600	600
2—N-*	2700	G.E.	415	250
1—N-*	2500	Whse.	700	108/162
1—N-*	2300	Whse.	600	92/132
2—N-*	2000	G.E.	250	320/350
2—N-*	1750	G.E.	600	200/300
1— *	1500	Al.Chal.	600	120/240
3—N-*	1500	Whse.	600	300/700
2—N-*	1400	G.E.	250	165/300
6—N-*	750	Whse.	250	300/700
1	750	Whse.	250	200/400
2— *	650	R.&S.	300	1000/1350
2	600	Al.Chal.	600	200/600
1	600	Whse.	250	110/220
2	300	Whse.	230	300/600
2	235	Whse.	230	325/975
1	150	Whse.	230	400/1200
1	125	Whse.	230	450/1050
3	125	Whse.	230	550/1125
1—N-*	100	Whse.	250	350/700
N—New and unused.				
1—N-*	100	Whse.	250	350/700

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HYDRAULIC STRAIGHTENING PRESS

Combination Horizontal & Vertical, mfd. Baldwin Locomotive Works, 1945, Ser. #33225, capacity: 825 Tons or 29" dia. ram, Vertical Stroke 20", Horiz. ram stroke 34" at 251 tons, distance between columns 137", max. daylight 58", 40HP motor, 2 Horiz. rams, (1 left, 1 right), 1 Vert. ram, approx. weight: 101,000#, Dimensions: 23'L x 10'W x 24'H.

A. O. HALL

1362 SHAWVIEW AVENUE
EAST CLEVELAND 12, OHIO

PO. 1-6917 — LI. 1-0191

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THE SIGN OF QUALITY—THE MARK OF DEPENDABILITY

AUTOMATICS
9/16" Cleveland Model A, m.d., 1943
1½" Foote-Burt Single Spindle, m.d., 1943
4 spindle 1⅝" Cleveland, Model M, m.d.
4 spindle 2" Model K Cleveland, m.d.
2½" Cleveland, m.d., Model A
3½" Cleveland Model A Single Spindle, m.d., late
5½" Cleveland Model A, single spindle, m.d.
No. 4D Potter & Johnston, m.d., late

BOLT THREADERS
Victor Nut Facing Machine, m.d., cap. ⅜" to 2" nuts
1½" Landis 2 spindle, m.d.
1½" Landis Bolt Threading Machine, double head stay bolt, m.d.

BOREMATICS
No. 44 Heald Facing Type Boremetic, m.d.
Model DB-102 Excello Double End Boring Machine, m.d.
No. 47A Heald Single End Boremetic
No. 49 Heald Double End Boremetic, m.d.

HORIZONTAL BORING MILLS
No. 25T Giddings & Lewis, m.d.
No. 41 Lucas Horizontal Table Type, m.d.
2½" bar, Model 25RT Giddings & Lewis, table type
3½" bar Cincinnati Gilbert Horizontal, Boring, Drilling & Milling, floor type
3⅛" bar, No. 32 Giddings & Lewis Table Type, m.d.
4" bar Universal Horizontal Table Type, m.d., late and good
4" bar, No. 42 Lucas Horizontal Table Type, m.d.
4½" bar, Model 72, Niles-Bement-Pond, m.d.
5½" bar Niles-Bement-Pond, m.d.
6" bar Sellers Floor Type, m.d.
Barrett Double End, 5" and 7" spindle, m.d.

VERTICAL BORING MILLS
16" Bullard Mult-Au-Matic, m.d.
24" Bullard Spiral Drive, m.d., 1944
36" Bullard, m.d., late 1944, Spiral Drive
36" Bullard New Era, m.d.
42" Bullard, Spiral Drive, m.d.
42" King, m.d.

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THE EASTERN MACHINERY COMPANY

1002 Tennessee Avenue, Cincinnati 29, Ohio

MElrose 1-1241 — CABLE ADDRESS—EMCO

PRESSES

STAMPING & FORGING EQUIPT.

1300-Ton Nat'l. Maxipres, 80 SPM, 10" Str., 1955
920-Ton Toledo #60, Bed 47x72, Stroke 20", 1943
700/390-Ton Toledo #797E, Bed 127x83, Dbl. Act. Toggle
600-Ton Ferracute E601, Coining, 6" Str. 30 SPM, Mfg. '50
440-Ton Bliss #210, Bed 37x36, 35 SPM, Side Shear, Stroke 16", Mfg. 1953
440-Ton Toledo #59¼, Bed 41x48, Stroke 12"
255-Ton Toledo 58½B, Bed 43x42, Stroke 12"
150-Ton Cleve. 60-D-84, Bed 86x46, Stroke 14"
3000# Chambersburg "Ceco Drop" Hammers, 1951
Upsetter: 7" Ajax Horiz. Heading & Forging machine. Air Clutch, 25 SPM, Mfg. 1943. Must be moved. No reasonable offer refused.

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AMERICA'S LARGEST STOCK OF FOUNDRY EQUIPMENT

ARC MELTING FURNACES
250# LECTROMELT—185 KVA
500# LECTROMELT—200 KVA
1000# SWINDELL—500 KVA
2000# SWINDELL—1000 KVA
3000# HEROULT, Door Charge—800 KVA
10' Top Charge Arc Melting Furnace
11' LECTROMELT TOP CHARGE
12' SWINDELL Top Charge—5000 KVA
DETROIT FURNACES—10 lb to 3000 lb. Cap.

INDUCTION FURNACES
20 KW AJAX Spark Gap 17# Melting
30 KW VACUUM Melting, Complete—Like New
100 KW AJAX Melting Installation—Late

WHEELABRATOR Sheet Cleaning Machine 48" wide capacity

HEAT TREAT FURNACES
4'x4'x10' Gas Fired Box
7' G. E. Rotary Hearth Electric, 1900°F.
36" dia. x 36" deep Electric Recirculating
46" wide Roller Hearth 50'L w/atmos. gen.
210 KW LINDBERG conveyor type. 1400°F.
10"x12"x24" LINDBERG 2500°F. hydrogen

CLEANING EQUIPMENT AND GRINDERS
20x27 WHEELABRATOR
27x36 WHEELABRATOR w/loader
36x42 WHEELABRATOR w/loader
48x42 WHEELABRATOR w/loader
dust Collectors available for all machines
WHEELABRATOR No. 1-A Multi-Table
48" WHEELABRATOR Swing Table
72" WHEELABRATOR Swing Table
96" WHEELABRATOR Swing Table
6' LK PANGBORN Table-room
PANGBORN Pipe Cleaner, 2" to 14" O.D.
SAFETY 10 H. Swing Grinder
WHITING 26"x54" tumbling barrel

. . . SPECIAL . . .
15 Ton Double Leg A.C. Gantry Crane
50" Magnet

Model 43 LIQUAMATTE wet blasting cabinet. Brand New. Ideal for finishing and cleaning tools, dies, molds, etc. at 50% SAVINGS.

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9' X 3/8" BERTSCH PLATE STRAIGHTENING ROLL

Model No. 12 Mangle Type, 7 Rolls 11" dia. (4 upper rolls, 3 lower rolls), 20HP & 7½HP motors, Serial No. M-7058, mfd. 1943.

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HIGHER CAPACITY
MODERN DESIGN
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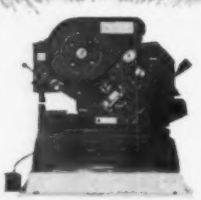

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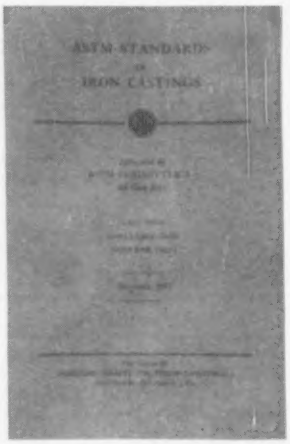

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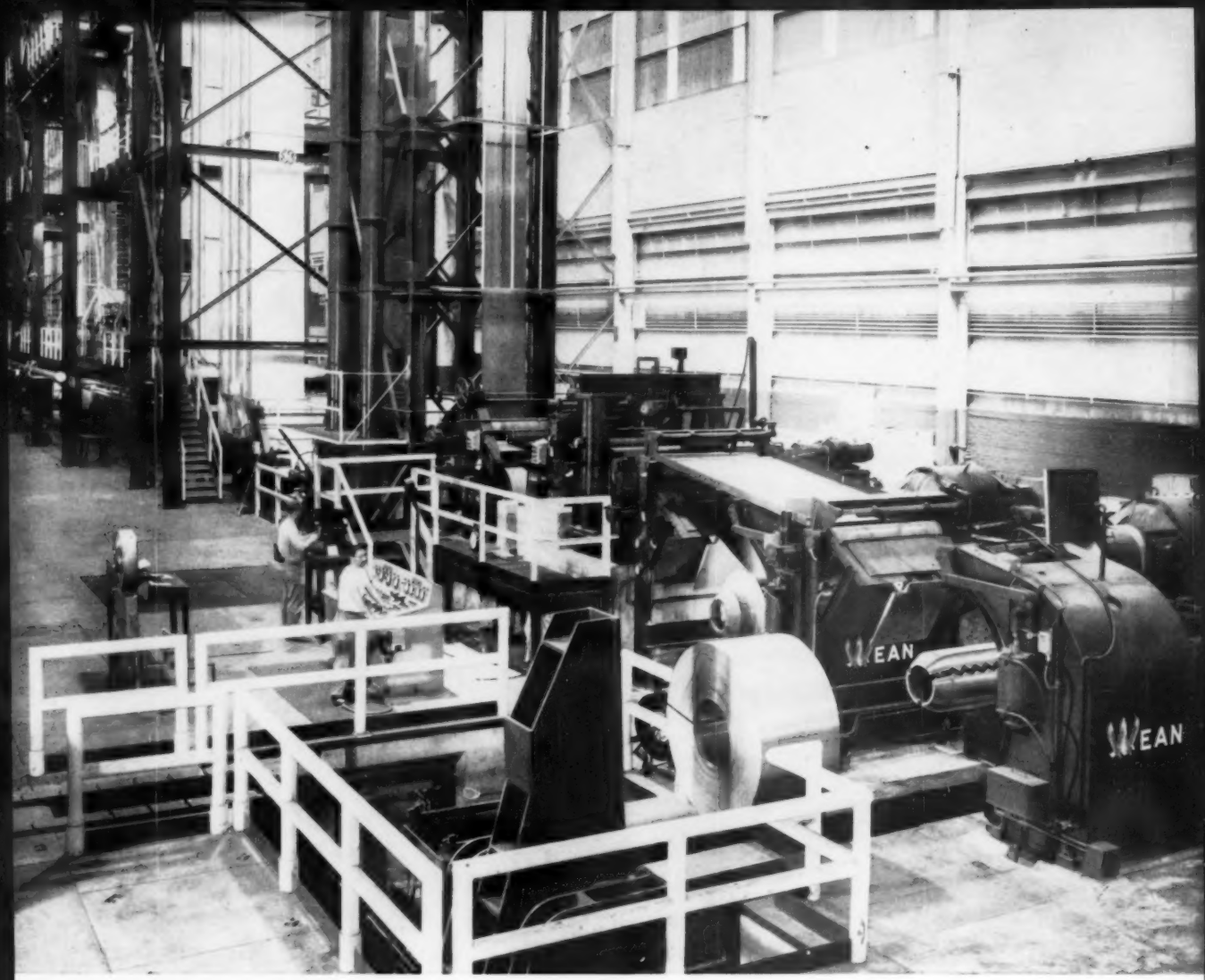

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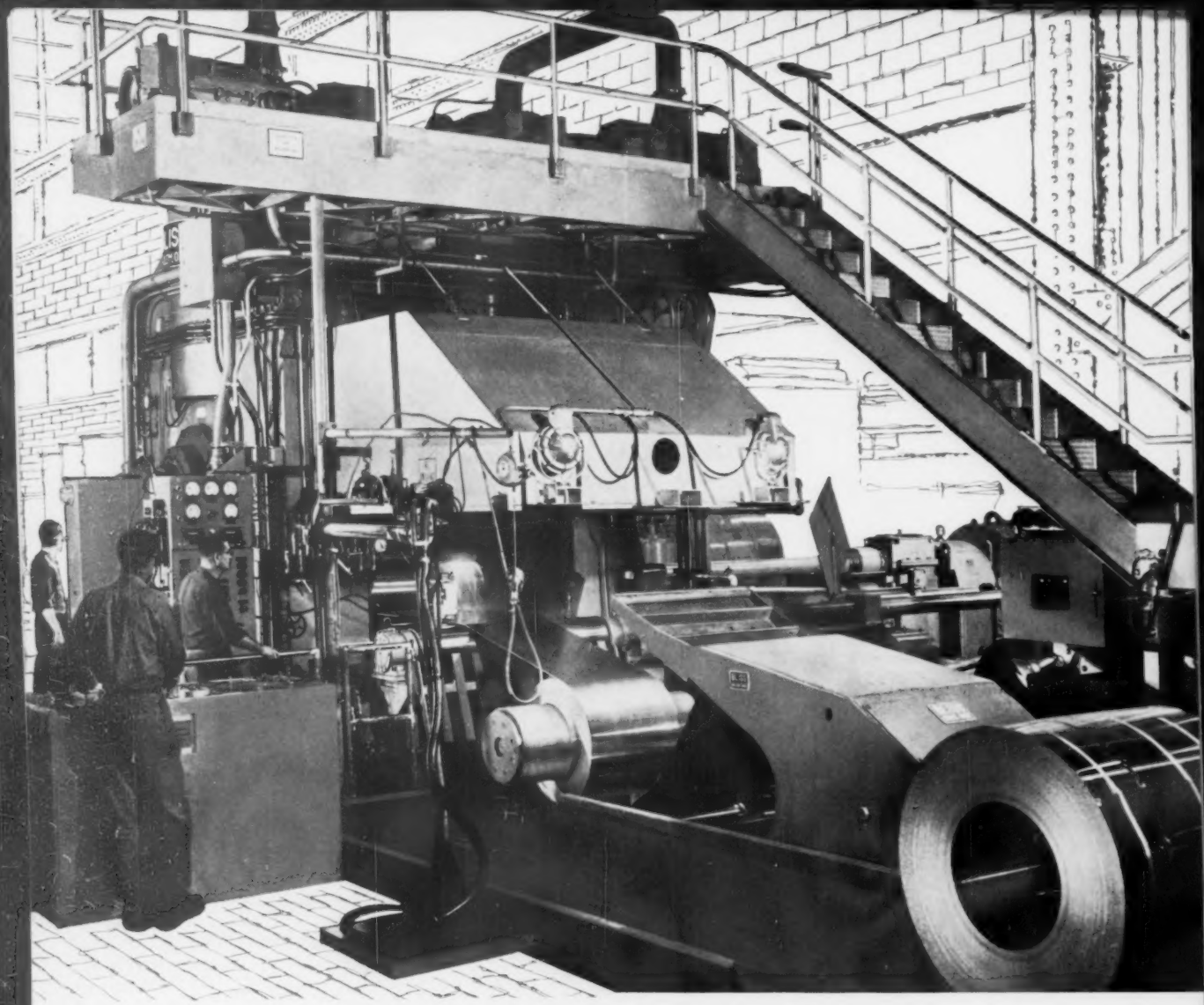

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